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ABSTRACT

Proceedings of the Pacific Region Association for Higher Education (PRAHE) are presented, including 5 opening speeches, 6 plenary lectures, 7 invited lectures, and 13 general papers. Presentation topics include: higher education and societal change; educational exchange and the Pacific Rim; international cooperation through electronic media; cooperation of higher education with industry and research institutions; case studies of international cooperation (Korea, Australia); prospects and problems in international cooperation; university-industry cooperation; research collaboration of higher education with industry and research institutions; the Philippines' Colombo Plan Staff College for Technician Education, a case of successful cooperation between developed and developing nations; bridging the cultural divide at Obirin College (Japan); a dynamic projection for cooperative development; the University of British Columbia and international cooperation in higher education in the Asia-Pacific; the higher education research agenda for teaching and learning in a multicultural setting; the British Council's linkage role in international education; international relations from the viewpoint of self-evaluation and reform tasks at the University of Tsukuba (Japan); relationship between "caution index" and student demographic data in a Japanese language placement examination situation; direction for cooperative higher education; science education and the language of instruction; curriculum reform for cultural literacy; university management of technology transfer; and college-level engineering education for industry workers. Conference program and information about the conference organization and advisory committee are appended. (MSE)

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Proceedings of the
'88 PRAHE Seoul Conference

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HIGHER EDUCATION AND THE ASIA-PACIFIC CENTURY

EDITED BY
CHUL-HWAN KIM and WHA-KUK LEE

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PREFACE

In the midst of a rapidly changing world the universities as an academic society bear a great responsibility to contribute to the world culture, by creating new knowledge and technology.

Each country has its own political, socio-economical and cultural environment while pursuing common educational objectives, and the promotion of human welfare.

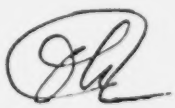
As the world becomes ever smaller and the "Great Pacific Age" is recognized in this Asian-Pacific era, multilateral communication and cooperation should be enhanced in order to seek the solutions to the problems in higher education.

The conference on the theme "Higher Education and the Asia-Pacific Century," held in Seoul was a fruitful event, where each participating country offered ideas, views and suggestions for the promotion of higher education.

The Conference has been inspiring and PRAHE has been successfully recognized as an organization that serves the Pan-Pacific Community.

We are indebted to all the members of the advisory committee and the organizing committee for their contributions to the conference.

We also express our deep appreciations to the sponsors, the Ministry of Education and the Daewoo Foundation, who generously provided the funds for this event.



Joon-suk Oh, Ph.D
Chairman
Organizing Committee

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Opening Address

Hyo-kyu Kim
President
Ajou University, Suwon, Korea

Dr. Young-shik Kim, the Minister of Education, Dr. Whittaker, President of the Pacific Region Association for Higher Education, honorable guests, distinguished scholars, ladies and gentlemen, on behalf of the host institution, Ajou University, I take a great pleasure in welcoming all the participants and guests to the '88 PRAHE Conference. My special thanks go to Minister Kim and Dr. Suk-hee Lee, Chairman of Daewoo Foundation, who are with us today for this important occasion.

We are living in the midst of rapidly changing society that will be totally dependent upon good science and good technology in the future. To acquire the sound basis in the development of science and technology, good higher education is essential and the importance of the higher education can never be overemphasized.

The world is becoming ever smaller and it appears imperative to have a mutual cooperation and assistance among different countries in order to keep up with the new knowledge and ideas and to make contributions to promote the healthy development of higher education.

In this era of Asian-Pacific, the cooperation among the Pacific rim countries could be fruitfully achieved through the activities of an internationally learned society as PRAHE. In this regard, Dr. Whittaker, I would like to express my sincere appreciations to you as this conference is organized as an annual conference of PRAHE.

The theme of the Conference I believe is the most appropriate and is dealing with the important, two broad topics on the international and inter-sectorial cooperation, as I understand, for further developing the theme in tune with the Asia-Pacific Century.

I believe that this conference will provide a valuable opportunity to communicate each other on what we can do for the enhancement of higher eduation in this region.

I also believe that this conference would make a great step towards promoting mutual understanding and friendship among the countries gethering together here in Seoul, the City of '88 Olympics which will be opening on September 17, in a month from today.

Finally, I would like to express my sincere gratitude to the contributors and participants to this conference, to sponsors the Ministry of Education and Daewoo Foundation and to the members of the Organizing Committee and Advisory Committee who all made this conference possible and no doubt successful.

I am also indebted to the members of the Korean Council for University Education and Ajou University for the arrangement they made here for all of us.

Thank you very much.

Welcome Address

Wan-kyoo Cho
Chairman of the KCUE and President of
Seoul National University, Seoul, Korea

Respected scholars, honored guests, ladies and gentlemen, I would like to extend my most sincere welcome to all of you, especially to the foreign guests from Asian-Pacific nations which will come to the forestage of world affairs in the coming century.

As is well-known, today's world is confronted with considerable difficulties due to the conflict and hostility between nations, races and ideologies in spite of all the efforts to pursue everlasting happiness and prosperity of mankind.

It is not easy in the least to find a key to the problem. Only by extending knowledge and understanding of the cultures and value systems of other nations can we find a clue to mutual cooperation and promote it.

Universities, as an academic community, have the responsibility to create a new knowledge and technology for the promotion of human welfare. Contribution to the world culture on one hand and to the development of their own nations on the other is the responsibility of the universities.

It is true that each country has its own peculiar political, economical, social and cultural circumstances. Accordingly, the educational aims and objectives each country pursues are different from one another. Nonetheless, universities, which are the hearts of civilization, should reconstruct their original function, and put proper steps into practice to fulfill the above mentioned responsibilities.

Universities throughout the world suffer from the following common agonies today :

First, the need to preserve academic excellence in accordance with the expanded opportunities for education.
Second, the need to change the functions and roles of universities to keep up with rapidly changing social demands and new challenges.
Third, the financial difficulty of meeting increasing educational demands.

Comparison and investigation into such agonies will provide common strategies for the development of university education as well as a unique model for each country. From this seminar will emerge many invaluable new approaches to international exchange and cooperation in university education. Especially this seminar would be more meaningful if we constructed a mutually dependent and supplementary relationship between universities and society by suggesting a cooperative system ammong universities, industry and research institutes.

As you all know, Korea, the host country of this seminar, holds the 24th Olympic Games in September. The youth from all over the world will get together, compete on the basis of their ability and yet strengthen their friendship. It is my sincere hope that you can extend your understanding of Korean culture and university education during your sojourn in Korea.

It is also hoped that as a result of your sincere discussion and contributions, this seminar will come up with a successful outcome. With my best wishes to you, your country and to university education, I would like to express my appreciation to all the participants.

Thank you.

Congratulatory Address

Young-shik Kim
Minister
Minstry of Education, Korea

Professor David Whittaker, President of the PRAHE, Dr. Hyo-kyu Kim, President of Ajou University, domestic and foreign distinguished scholars, and ladies and gentlemen, it is a great pleasure for me today to attend this occasion of the opening of the Pacific Region Association for Higher Education Conference and meet you all, and let me especially extend a warm welcome to those of you that have arrived from abroad.

Seeking to find a cooperative system and a common direction of development through international comparison and diagnosis of the university education in the Asian-Pacific region and at the same time having the goal of establishing a model of development for Korea's universities, this Academic Convention has great significance for the participating countries and their development of advanced studies. Needless to say, there is also special meaning in that it is being held in Seoul, the host city for what will be the grand festival of world harmony, the '88 Olympics.

All of the Koreans have mustered their devotion and wisdom and are engaged in flawless preparation so that the Seoul Olympics can surmount the barriers of beliefs and systems, be the largest and best ever with 167 participating countries and will be an Olympics that will genuinely open the doors to world harmony. We hope for your support for the Seoul Olympics, which is an extraordinary event not only for our country but for Asia and the Pacific region.

Ladies and gentlemen,

As you well know, universities have the important mission of fostering the second generation of our people who will be the leaders in pursuing for a future life of abudance and higher standards of living. Especially, the amazing development of academics and scientific technology and the rapid change in society calls upon universities to change continually their characters and functions.

Comprised of the interests of various peoples having their own unique historical and cultural enviornment, the world is now changing into a community of a single global village, and universities are converting from being ivory towers that maintained a distance from society to a community breathing together with society.

Moreover, with the position and role of Asian-Pacific countries gaining importance in the global village, it will be a very meaningful endeavor for this regions university education experts to gather together and exchange their interests and information on the current issues concerning the management of universities, and furthermore to construct a cooperative system.

I believe that the themes to be discussed at this seminar, "Case Studies on International Cooperation in Higher Education", "Prospects and Problems of International Cooperation",

"The Cooperative of Education in Higher Education", and "Research colaboration of Higher Education with Industry and Research Institutes", will not only greatly assist universities in adapting to the changes and developments in society and the international current, but furthermore will firmly establish the position of universities and contribute to the development of advanced studies.

Honorable university education experts,

To prepare for the highly industrialized societies of the 21st century, many countries are pursuing projects of Reforming Education from various aspects and in our country, too, long-term and comprehensive reform measures have been planned and parts of it have already reached the stage of implementation. In particular, the importance of university education is deeply recognized and we are devoting our utmost efforts to this field.

I would like to express my respect or the efforts and accomplishement that your esteemed countries have countributed to the development of university education, and I would like to learn much from your experiences. I would appreciate that if the experts that have gathered here would offer their frank advice and counsel.

At this moment when world history is reaching a new turning point of the coming of the Pacific era, this seminar will no doubt make the international cooperation of university in this region more intimate, and will also become an occasion to deepen the friendship between neighbor countries much like the Korean proverb, "your neighbors are your relatives."

In addition, for those who have came from abroad, I hope that you will have a healthy and satisfying journey during your stay in our country, and that you will have additional opportunities to visit our country.

Lastly, I would like to thank the President of Ajou University, the Chairman of Korean Council for University Education, and the many individuals that helped prepare this convention, and wish the continuous development of the Pacific Region Association for Higher Education and the good health of all you members.

Thank you.

Higher Education and Societal Change : The Vanguard Personality Syndrome of University Students

David Whittaker
University of British Columbia, Canada

It is an honour as President of the Pacific Region Association for Higher Education to address the opening plenary session as we begin our conference on the theme "Higher Education and the Asia-Pacific Century." It is also an honour and pleasure to us all that our Association is meeting for the first time in Seoul and that Dr. Park of the Republic of Korea is President-Elect. May I also take this moment to thank formally, on behalf of the whole Association, all those who have taken the various responsibilities and given of their time and effort to mount this conference. We greatly appreciate their commitment.

1. Sociological Background

In 1981, the President of Korea recognized the "Great Pacific Age" and suggested the creation of a Pan-Pacific community to enhance multilateral communication and cooperation (Chun, 1988). The PRAHE has concomitant goals. But as Chun further states that, in general, with obvious exceptions, neither Korean professors and teachers nor students and citizens are always well informed about all the Pacific Rim countries—and this relative lack of knowledge about each other is equally and mutually true on the part of those other countries, too—this non-understanding and misunderstanding remains the basic challenge of the ongoing thrust of internationalism as a philosophy and as a policy, of foreign student education as an experience, and of global education as a social studies curriculum at all educational levels.

Information, or knowledge (which has a more enlightened, experiential, perceptive connotation) is fundamental. A substantial international outlook is obtained when individuals attain a particular Weltanschanung, via a complex, idiosyncratic system of formal and informal learning, that heightens their awareness of the interconnectedness of peoples and countries physically, socially, economically, politically and ethically and how local decisions and actions may have repercussions, direct and indirect, expected and unexpected, known and unknown, on other people in other places. Such an outlook necessitates and education that not only imparts the relevant information but also enhances the intuitive and emotional components to deal with the moral issues of our time. The three C's of this international viewpoint have been stated, firstly and secondly, as the aforementioned Communication and Cooperation and, thirdly, Conflict Resolution—each successively more difficult to do whether at the personal, psychological level between individual personalities or all the way up at the level of international relations between countries.

The dramatic changes that have been occuring recently in many pacific region societies in a relatively brief span of historic time has led to unparalled socio-economic readjustments, both within such countries as well as between countries, as they react to the new economic order and the changing relationships. Industrialization has been rapidly evolving and highly technical, post-industrial trends are arising where the ability to process and deal with complex information is paramount, the so called information society. These accelerating changes have had a differing, mixed effect on specific individuals, families, subgroups, cities and countries and their interrelationships. Changing living patterns and qualities of life, although often positive in certain aspects, have also been accompanied by personal frustrations, social tensions, environmental stresses, competing and conflicting pressure groups, policy struggles, political crises, and international differences.

The future years are going to require us all to modify our belief systems and adjust to the range of further changes that ultimately are coming as we approach the uncertainties of the 21st century. Social change is inevitable. What direction it will take is uncertain. Futurists offer differing scenarios for the distant future. The projection to the nearer, more foreseeable future perhaps can best be estimated by an analysis of clues of the past and present conditions and stresses, the value system of the vanguard, and the resulting evolutionary zeitgeist. Whatever the clues and trends that arise, a society's educational system will be involved in social change as part of the problem and/or the solution.

2. Role of Higher Education

Institutions of higher education, striving for excellence in order to fulfill their mandate, assume specific underlying policies including the quest for superior students, procuring an optimum learning environment, and the cultivation of diversity. Universities, however, are placed in various dilemmas as they face the reconciliation of the multiple roles of conservator of the society's history and cultural traditions, resolver of contemporary social needs, and innovator of new ideas and approaches to anticipate the future societal change. The American campus, for example, has undergone significant educational adjustment, reform and experimentation in the recent past as a response to the forces of social change and this modification has been fully documented and examined by the extensive survey of Grant and Riesman(1978).

Historically, society's relationship with higher education has continually fluctuated as the very situational relationship is ripe with the potential not only for cooperation and common interests but also for conflict and differences in value systems. For example, the problem of university autonomy and government policy is a classic balancing act that societies, over the centuries and in the present day, have experienced with varying out-comes. The universal commonalities within the world fraternity of institutions of higher education enables us to recognize well the basic predicaments, if not the subtleties, faced by specific universities and countries at particular times. It is an occupational hazard of our profession and a continual struggle.

3. Socio-psychological Perspective

As a psychologist in higher education I have specialized for the last 25 years in the socio-psychological study of university students—surely the raison d'etre of higher education—their personalities, their longitudinal change and development during their university years, their value systems, and their subcultures, often, necessarily, within the context of social change. Although much of my research focuses on North American university students, there are likely numerous general factors and dynamics that are similarly involved. And similar conclusions can be drawn, either regardless of or within the context of, the specificity of a particular society or Zeitigeist. The commonalities of the human personlity and the human condition are overridingly universal. And university students the world over, that special biased sample of youth, that particular time in their young adulthood, and that unique milieu with its pressures and stimulations within which students exist, have a unique universality that we all have experienced and continue to sense.

Personally, as a product of the undergraduate years of the 1950's, the "Quiet Generation" at the University of British Columbia at Vancouver, I suddenly found myself in the 1960's at the University of California at Berkeley as a foreign doctoral student, a time and place of particularly radical social innovation and political dissidence. This changed "temper of the times" was especially focal to social scientists interested in the dynamics of such important phenomena within the student subcultures. The status quo was under sttack on many levels. It was heady and it was the beginning of my formal research involvement and of my general area of specialization decision.

4. Psychology and the FSM

Watta and Whittaker (1966) studied the politically dissident, idealistic, anti-war, student Free Speech Movement (FSM) on the Berkeley campus during its actual historic takeover of the University's administration building and which eventually led to the largest mass arrest, seven hundred and seventy-three individuals, mostly students, in American history up to that time. On an instrument designed to measure, among other variables, the dichotomized personality dimension of Rigidity-Flexibility, the FSM samples were significantly more flexible than a comparative sample of U.C. students-in-general, i.e., they could mobilize greater freedom of reaction, rather than behave with cautious guardedness, and in the extreme they could lack even defensive caution. Adjectives descriptive of this flexible personality, as contrasted to the rigid, include : active, adaptable, adventurous, aggressive, argumentative, assertive, confident, demanding, egotistic, energetic, fluent, idealistic, independent, impulsive, informed, irritable, liberal, organized, outspoken, progressive, quick, rebellious, resourceful, self-centered, spontaneous, talkative, unconventional and uninhibited. Furthermore, flexibility is negatively related to conformity, ethnocentricity and authoritarianism.

From a socio-psychological point of view, the assessment of attitudes and beliefs is fundamental in order to understand persons, institutions, subcultures or societies. These value systems are especially important to consider in times of both personal and societal tensions and to ascertain the influence of interactive variables. At the level of the individual,

personality is the central, descriptive, motivational and explanatory factor and subsumed under this rubric is one's value system, cognitively and opertionally. The availability of reliable and valid measures of such personality attributes is a central research concern of psychologists.

5. Six OPI Studies of Students

The Omnibus Personality Inventory, Form F (Heist & Yonge, 1971) was developed and revised at the Center for Research and Development in Higher Education, University of California at Berkeley, during the 1950's and 1960's, and where I spent a five year post-doctoral. Evolved within the general framework of personality theory, the OPI is a non-clinical insturment especially constructed to assess attitudes, values and interests particularly relevant to the socio-psychological and intellectual ego-functioning of university students and normed on students-in-general. The OPI generates a profile on fourteen scales, all within the realm of normality, useful for psychologically describing individuals and subgroups and their intercomparisons. These variables are briefly described in Table. 1.

Table 1. Brief Description of the 14 Scales of the Omnibus Personality Inventory (OPI) Form F:

(TI) Thinking Introversion: Persons scoring high like reflective though and activties. They express interests in a broad range of ideas in a variety of areas, such as literature, art and philosophy. Their thinking is less influenced by generally accepted ideas than that of lower-scoring thinking extroverts who show a preference for overt action and tend to evaluate ideas on their practical, immediate application.

(TO) Theoretical Orientation: This measures an interest in a more restricted range of ideas than is true of TI. High scorers are intersted in science and a preference for using the scientific method in thinking. They are Logical, analytical and critical towards problems.

(Es) Estheticism: Highs endorse a diverse appreciation of artistic matters and activities. The focus of their interests tends to extend beyond painting, sculpture and music and includes literature and dramatics.

(Co) Complexity: This reflects an experimental orientation rather than a fixed way of viewing phenomena. Highs are tolerant of ambiguities and uncertainties, are fond of novel situations and ideas, very much prefer diversity, and are disposed to seek out and enjoy such experiences.

(Au) Autonomy: The characteristic measured is composed of non-authoritarian attitudes and a need for independence. Highs are independent of authority as traditionally imposed through social institutions. They tend to be realistic, tolerant, and intellectually liberal.

(RO) Religious Orientation: Highs tend to be skeptical of traditional religious beliefs and practices, especially the very orthodox or fundamentalistic. Persons scoring adove the mean manifest a liberal view of religious beliefs and lows tend to be skeptical of contrasting viewpoints.

(SE) Social Extroversion : This reflects a preferred style of relating to people in a social context. Highs display a strong interest in being with people, and seek and gain satisfacton from social actives. The lower social introverts need more privacy and tend to find social interaction less fulfilling.

(IE) Impulse Expression : This assesses a general readiness to express impulses in conscious thought or in overt action. Highs have an active imgination, value sensual reactions, and their thinking and behaviour have overtones of feeling and fantasies.

(PI) Personal Integration : The highs experience few attitudes or situations that characterize the socially self-critical. Lows are aware of their self-perceived, asocial tendenies and express feelings of solitude.

(AL) Anxiety Level : Highs have few feelings of anxiety nor are they nervous or worried. Lows respond that the, feel tense and high-strung and experience tension in their social environment.

(Am) Altruism : Highs are affiliative persons and trusting in their relations with others. They exhibit concern for feelings and welfare of people. Lows are less concerned about others and view people from a more objective perspective.

(PO) Practical Outlook : Highs are intersted in practical, applied activities and value concrete accomplishments. The criterion they most use to evaluate ideas and things is immediate utility.

(MF) Masculinity–Femininity : This assesses some of the traditional, conventional differences in attitudes and interests beween men and women. Highs (masculine direction) deny interests in esthetics and admit to few personal problems or feelings of anxiety. They tend to be less socially inclined and more interested in scientific matters. Lows (feminine direction), besides stronger esthetic and social inclinations, admit to greater sensitivity and emotionality.

(RB) Response Bias : This represents an approach to assess the inventory-taking attitude. Very high scorers may be responding similar to persons who were explicitly asked to "make a good impression" by their specific responses.

The following six research studies that will be discussed use this instrument and relate their seminal findings to a psychologically consistent syndrome associated with subgroups involved with social change (Whittaker, 1987a). Their profiles are illustrated in Figure 1 in standard T-score format(where the norm mean is 50 and the standard deviation is 10).

Heist (1966) notad that highly committed university student political activists, those same FSM students previously studied by Watts and Whittaker and measured sometime after their release from arrest (and whose idealistic protests eventually led to needed social change), generated a consistent, highly unique, mean group profile on the OPI compared to students-in-general. This pattern or scores consisted of three prominent characteristics : (a) an intellectual disposition syndrome with Thinking Introversion and Estheticism scales relatively higher than Theoretical Orientation, and Complexity highest of all, forming what is now called the unique "J-curve", (b) a non-anthorization syndrome with very high Autonomy and high Religious Orientation (liberal rather than orthodox direction) ; and

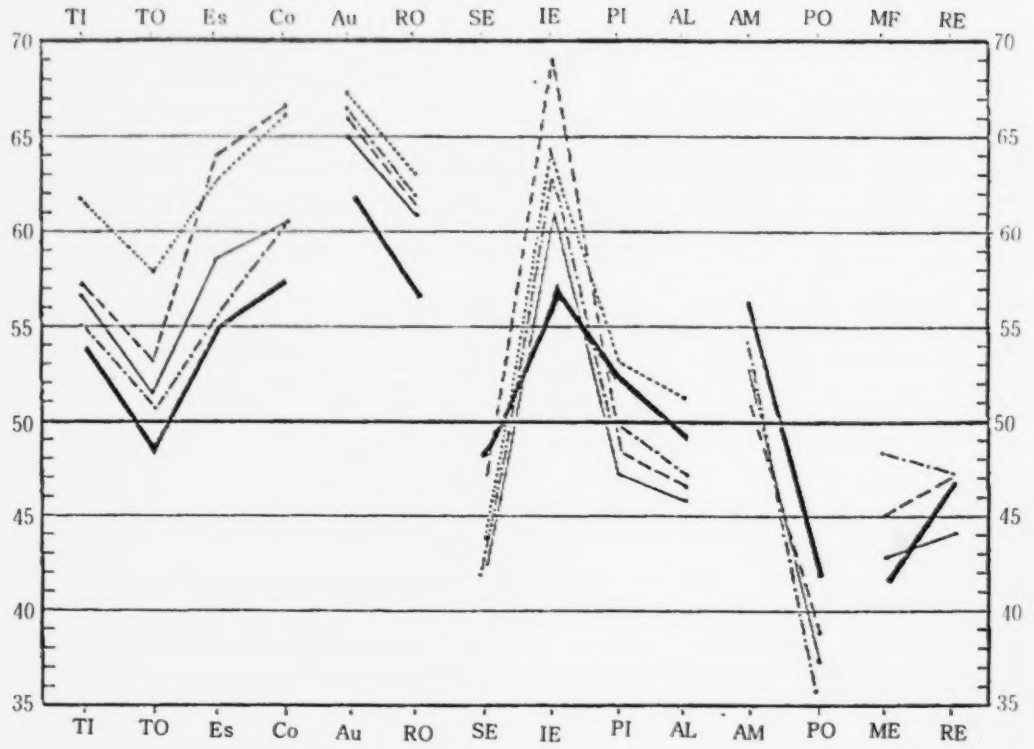

Figure 1. Omnibus Personality Inventory (OPI) Form F Mean Group Profiles of Five Different Youth Subgroups Involed In Social Change.

..... Free Speech Movement Students (Heist, 1966).
– – – – – Counter–Culture Nonstudents (Whittaker & Watts, 1969).
——— Women's Liberation Movement Students (Whittaker & Elias, 1976).
——— Community Education Program Students (Whittaker, 1985a).
—·—·—·— Socio–Political Vanguard Students (Whittaker, 1987b).

(c) a socio-emotional adjustment syndrome with very high Impulse Expression and comparatively lower but moderate Social "Introversion," Personal Integration and Anxiety Level. (The remaining four scales, basically unrelated and therefore not to be considered as syndromatic, had not been finalized at that time and therefore were not administered.)

Interestingly, this very same OPI group profile, again significantly unlike a sample of comparative students-in-general, was obtained by Whittaker and Watts (1969) in a second study from another, contemporary, different, social change movement : disaffiliate, non-conformist university-dropouts who were members of the vanguard countor-culture (and whose values also were destined to modify social mores). This subculture, rejecting the traditional, tended to withdraw from conventional rigid society whereas the political acti-

vist subculture confronted this same society from within to force change. Now four further prominent characteristics were noted with the use of a revised version of the OPR with the addition of four more scales : (a) moderate but nonetheless above the mean Altruism, (b) low Practical Outlook, i.e., an interest in broader issues rather than the immediately mundane and practical ; (c) moderate but below the mean Masculinity-Femininity, and a finding not entirely related to actual gender ; and (d) moderate but below the mean Response Bias.

A third sample of a social change movement was assessed by Whittaker and Elias (1976) using the OPI. It was hypothesized that the university students of the Women's Liberation Movement would project the unique "social change" group profile previously identified and, indeed, this was found as significantly contrasted to a comparative sample of female students.

Fourthly, this interesting OPI phenomenon was noted in other data collected at U.B.C. by Whittaker (1985a). In contrast to the large, regular program in teacher preparation, a small, limited enrollment (approx. 40 students), optional, alternative program was offered. This unique Community Education Program was more demanding, specializing in situation specific community school needs and how educators could interact with the neighbourhood, often multicultural, to ameliorate local problems and directly and indirectly affect social change. Students who self-selected to enroll in this program proved to be a very *biased* sample of education students as measured by the OPI. Over the years, five different incoming classes of these particular students were assessed and they each consistently generated the social change profile whereas a comparative group profile of the regular students, who were, of course, in the vast majority, did not project this pattern.

In terms of university students specifically in teacher preparation, Whittaker (1985b), using the OPI in a fifth study, cross-culturally compared student samples in Canada, the continental United States, Hawaii (where sixty percent of the students were of Japanese extraction), and the Philippines. Although the Canadian and Hawaiian profiles appeared somewhat similar and the Philippine least similar to the others, *none* of the group profiles projected the social change pattern. This seems to confirm that, in general, students in teacher education, are not psychologically prone to be motivated to be overtly involved in social change movements and that such professional faculties tend to attract rather tradition-bound students with rather conforming value systems.

Lastly, in the sixth study, a secondary analysis of a large sample of U.S. students who had completed both the OPI and an extensive questionnaire has been done (Whittaker, 1987b). On the basis of a cluster analysis of survey items relating to their senior year subcultural interests, seven significantly distinct orientations were identified—and each generated a distinct OPI mean group profile. One subcultural grouping, Group #5 and labelled the Socio-Political Vanguard, combined an interest in social/political issues with non-conformity and *only* this group displayed the previously identified social change pattern on the OPI. Approximately five percent of the students fell into this group.

In this latter study, which was longitudinal, it was possible to generate the *freshman* mean group profile on the OPI of those who, as seniors, were classified as the Socio-Poli-

tical Vanguard because the instrument had been administered at the beginning and at the end of their four years at university. The freshman mean profile was, already, a recognizably "social change" profile form, suggesting that as freshmen they already had the psychological propensity for social change involvement. By their senior year this group profile had become more pronounced, more extreme, with significant increases in Thinking Introversion, Complexity, Autonomy, Religious Orientation, Impulse Expression and Altruism and decreases in Social Extroversion and Practical Outlook. At this point it is unclear as to whether this change is due to maturation or socialization (or enculturation) or, most likely, some unknown degree of interaction between the two processes. Psychological research does indicate, however, that for many students their value systems are well formed by the time they enter college and that their systems are more "modified," if at all, rather than radically "changed," by their college years and experience.

6. The OPI Social Change Syndrome

It is important to mention that the OPI must be interpreted not just by an appreciation of the score value of each scale as a separate entity but as a total profile "shape" and thus the relative relationship of the scales to each other as an interactive unity. It is this interrelational fact that this unque mean profile, which was consistently found only in these particular social change subgroup and which therefore leads it to be identified and labelled as a "social change syndrome," which is interpretively meaningful and explains and predicts behaviour. The point also needs to be made that those extreme scales, individually, that define the syndrome are in the direction in which persons tend to move, as shown in long-itudinal research, who have increased sophistication due to the interaction of time, experi-ence and education. Thus this syndrome suggests a rather superior, high potential for innovation, type of individual and when such an individual is joined in a critical mass of similar others it can be a formidable, often altruistic, force to challenge established mores and policies.

These very homogeneous within-groups and between-groups research findings on the five different subgroups, each having in common a strong antithesis to particular aspects of the conventional, traditional mores of the status quo and a propensity to take some form of decisive action to accommodate their desire for change, validate a uniquely specific OPI profile that seemingly is derectly related to the psychological motivation for social change, namely : (a) a strong interest in and openness to novel, diverse ideas and ex-periences concomitant with a tolerance of ambiguity ; (b) a courageously and highly in-dependent, non-conventional, non-authoritarian attitude ; (c) a general readiness directly to express and act on their impulses ; (d) and an interest in broader issues rather than limited to the immediate, ordinary and practical.

7. Social Change and Higher Education

The social change syndrome can be viewed as an important factor in socio-psychological research and as a methodology with considerable ethical implications if misused. The findings point to the inherent ramifications of the fundamentally central issue of the individu-

al and society and that the relationship is basically founded on belief systems that are of varying degrees of compatibility. Higher education often is the intermediary, the go-between, in this interaction and is often pulled both ways at once. All university campuses have faced this dilemma and , as in the Republic of Korea, it is interesting to observe how change and reform is evolving (Koo, 1988). These ramifications are unavoidable but challenging. They relate, as does the notion of a social change syndrome, to consideration of the value systems of soiety, in general, and indiveduals, in particulcular, as a force for the status quo or social change and the recruitment of individuals and/or ideas for their innovativeness and thus the utilization of this potential influence on the future direction of paritcular social systems and, in the final analysis, of society.

In this respect, Whittaker(1987c) stresses another responsibility of higher education and its future impact, internationalism and the foreign student, and the belief that one of the most important personality characteristics of the foreign student, ideally, would be a propensity similar to the social change syndrome. Such a person would be a propensity similar to the social change syndrome. Such a person would be open to new experiences and ideas--one of the fundamental purposes of a foreign education is such an exposure and such an open outlook would ameliorate the adjustment to cultural shock--and would be so motivated that certain new ideas learned would be selectively applied on return home within the framework of local traditions. Thus the advancement of social change, no matter at what level, might be initiated from "what is" to "what ought to matter at what to be."

8. Concluding Remarks

Aldous Huxley (1961) in his essay on human potentialities asks that very simple and seemingly absurd question : What are people for? As an act of faith and concerned with human decency and liberty, he believes "that man is here for the purpose of realizing as much as possible of his desirable potentialities within a stable but elastic society"(p. 60). We in higher education can agree with this ideal statement. But a particular person's "desire" may not be desired by certain other members of that same society but if society is "elastic" enough perhaps it could some- how be accommodated. And if not? Inner tension? Overt action?

There is the distressing fact that Huxley alludes to that aggressive feelings can pay higher psychological dividends than gentler feelings. "They provide a greater kick" (p. 73). Social change and social conflict thus, seemingly, is prone to go hand in hand. The social change syndrome is psychologically prone to elements of overt action as indicated by the extreme need to express impulses. Can society, can higger education as a part of society, accommodate change? To the extent that they can is, surely, some measure of our democratic view of life. Hopefully societies can make such accommodations and compromises and be "elastic." This is a fundamental challenge to all of us in higher education.

Jacoby(1988) has recently warned North American academics of a portent that he senses : the university is in danger of becoming the kiss of death for a crusading spirit. If we educators do not, will not, cannot encourage and accommodate innovation, with all its often accompanying disruption and distasteful readjustment to some, this inability will

inevitably lead to stagnant conditions on and off the campus. This apathy, too, is a challenge to higher education.

It is said that Youth must be served. It is our responsibility in higher education to recharge our dedication to encourage all to realize their potentialities and to encourage, especially, somehow, those youth who have that rare, special, innovative spirit. Psychologically, in terms of this paper, this temperamental proclivity is scientifically labelled as "the OPI social change syndrome" but it just as easily might be labelled the "sinp aram," or "spiritual wind," that, according to the native Korean shamanism can be a major source of vitality. Whatever it is called, wherever it comes from, wherever it is found, it is the gift of the human potential.

The 21st century will be in the hands of today's youth. I hope we can hand it over to them having shown them, as a model to emulate, a world that, if not both stable and elastic, is at least moving in that direction. Perhaps our conference can contribute to this goal in some small way, and I am sure we all anticipate having an interesting, useful, and successful meeting together. Thank you very much.

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International Partnerships in Higher Education: Issues for the 21st Century

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There can be little mystery about the reasons higher education has become a topic of major concern in countries around the world. With economic productivity more closely linked than ever before to scientific advancement and technological expertise, nations look to their colleges and universities to prepare needed specialists, conduct basic and applied research, and provide well qualified teachers at all levels of education. At issue are national pride, economic health, and social stability. Higher education has become a global symbol of national aspirations. Not surprisingly, debate over its purposes and organization, its costs and effectiveness has engaged business and political leaders alike. Furthermore, there is growing awareness that to serve national interests, colleges and universities will have to change in significant ways. It is the suggestion of fundamental reform that has generated the most heated controversy and left educational leaders searching for new solutions to old problems.

India's new national policy of education offers a useful example. After a two-year development period, the policy is now being implemented. A major objective is to enable higher education "to move centrestage" so that it can "become dynamic as never before." (Government of India, 1986, p. 39) India wants to expand its higher education system and to render it more efficient. It wants faculties and institutions to be at once more autonomous and more responsive to national priorities. It wants to strengthen the research capability of faculty, and it wants research to pursue lines of inquiry that serve national interests. More precisely, it wants higher education to help solve India's unemployment problems through vocational and adult education programs, with particular reference to the needs of rural populations. But to serve people at the other end of the status scale, India also wants colleges and universities to support burgeoning high tech industries, notably in Bangalore, through specialized graduate programs and research initiatives.

Such objectives are recognized the world over. Countries large and small, new and old, developed and emerging have similar aspirations for their colleges and universities. While national differences affecting these institutions should not be discounted, all countries tend to share a renewed conviction that higher education plays a central role in promoting identifiable national interests. Although few can match Korea's phenomenal growth in higher education over the past twenty-five years, the various nations seem to have remarkably similar visions of the future and to share a sense of urgency about the need for improvements in higher education. (Koo, 1988)

Apparently we are also adopting similar reform agendas and strategies. The changes

being advocated affect basic matters of higher education policy : governance, curriculum, and student access. Specifically, debate has focused on proposals to find new ways of balancing centralization and decentralization in the control and organization of colleges and universities. A second area of controversy is curriculum policy, including questions about common or general studies, high priority programs in the sciences and technological fields, the relative importance of graduate and undergraduate programs, and the teaching effectiveness of university faculty. Finally, there is widespread concern about making higher education more accessible by changing admissions policies and providing opportunities for "distance" education, particularly for adult students and those who live in remote areas.

Each of these issues raises in turn questions about funding choices and the cost effectiveness of various programs and institutions. No country seems prepared to merely increase higher education budgets. All are eager to achieve economies of scale, eliminate program duplication, and identify those programs that promise greater returns on investments. And thus we hear calls for more cooperation and less competition among institutions and between them and business enterprises. In most of our nations, leaders would agree with Dr. Koo's(1988) recommendation for Korea that "both inter-university and college-industry cooperation should be encouraged and strengthened."(p. 10) In my country, as in many others, university consortia and cooperative projects linking higher education institutions and large corporations have been established as strategies to enhance resources and achieve economic efficiency. While the forms and goals would differ from such national ventures, similar cooperative arrangements within the international community might help individual institutions and national systems of higher education address both immediate concerns and long-term goals. I can state the point more bluntly : International partnerships can be as productive as national partnerships, whether among institutions or between universities and businesses, in preparing our respective systems of higher education for the 21st century. Because in each country we are working on similar problems, we can learn from each other as we test various solutions. Each country confronts dilemmas related to governance, curriculum, and student access. While we share other issues in common, these three appear on almost every country's list of the areas in which changes are needed for the present health and future potential of our respective systems of higher education.

1. Governance

As a general rule, countries with highly centralized systems of higher education have been relaxing restrictions on individual institutions, whereas countries like mine with decentralized modes of control have been moving in the opposite direction. In all of our countries, however, these trends are affected by the failure of scholars to "take seriously the province of their own commitment," as Burton Clark(1983) put it. Faculty, at least in the United States, seem willing to serve endlessly on various committees and to exercise prerogatives over academic policy, but they evince little knowledge of how universities

work or much interest in finding out. My point is simple : At this time of historic change in the governance of higher education, most faculty and university administrators are unaware of research that would help them bring empirical evidence to bear on reorganization proposals.

This situation should not be surprising. Higher education is a relatively new field of inquiry. Its rise to prominence in the United States has coincided with the expansion of enrollments and programs that occurred in the 1960s and with the formation of multi-institutional systems. Perhaps for different reasons, the field developed in other countries during the same period.

While some of the research it has produced compares organizational and policy phenomena cross nationally, most of the work tends to be localized case studies. (Clark, 1983) Applications of findings, particularly in a country other than the one in which the research was conducted, are often inappropriate. Nonetheless, work on the issue of governance in the United States may interest scholars and policymakers in other countries. Recall that the United States has no national ministry of education and no political mechanism in the federal government for controlling colleges and universities. The debate over governance has occurred, rather, at the state level.

At issue has been the extent of centralization. Before 1945, decentralization prevailed as each institution tended to have its own governing board. Now virtually all states have procedures for reviewing academic programs and developing comprehensive plans for public colleges and universities. (Schmidtlein, n.d.) Few have exercised close supervision of private institutions or provided them with funding. But some states have gone beyond coordinating and planning functions. Wisconsin and my own state of Maryland are among the small number of states that have adopted consolidated governing agencies which have authority to control the programs and determine the total appropriation, if not the itemized budgets, of individual campuses. (National Center for Postsecondary Governance and Finance, 1987) The primary reasons given by political leaders for such centralization "are insufficient accountability, absence of effective funding priorities, and insufficient strategic planning which has resulted in inadequately defined missions and in overlap and duplication of program offerings." (Berdahl et al., [n.d.], p. 3) In short, governors and legislators have acted to centralize control over higher education because they concluded that individual institutions, when left to their own devices, would not function in cost effective ways and routinely failed to be responsive to state priorities. In Maryland, the governor was particularly concerned about harnessing higher education resources in the service of state economic development, arguing that this goal could only be achieved by consolidating public institutions under a single authority.

Thus, in the United States current debate over governance tends to focus on two types of centralization, coordination and consolidation. But what are the effects of these two governing models? Within each structure, we can find some of the best American universities. The University of California, Berkeley, University of Virginia, and University of Illinois, Champaign-Urbana have flourished under coordinating agencies ; whereas the University of Wisconsin, Madison is part of a consolidated system. Note, however, that

this distinguished institution attained its stature before being consolidated with other Wisconsin universities. (Schmidtlein, n.d.) In fact, research evidence strongly suggests that the consolidated model tends not to promote academic distinction but rather has a leveling effect on all institutions under its authority. Often adopted as a substitute for providing new funds needed for institutional advancement, it represents a strategy to economize but typically fails in that goal as the costs of maintaining an enlarged bureaucratic structure mushroom. The evidence offers a set of correlations: as centralization increases, diversity within the higher education system decreases. Centralization encourages uniformity relative to funding ratios, programs, personnel policies, and institutional purposes, and with the spread of uniformity the system's capacity to respond accurately and quickly to economic and social conditions and to diverse audiences declines. (Berdahl et al., n.d.) There is also evidence to indicate that a more diverse and less centralized system can respond more effectively to business and government needs.

But surely there are limits to enhancing each university's autonomy. Without public funds, can institutions survive in remote or impoverished areas? And what steps should government take to ensure program quality? With limited resources for higher education, not all colleges and universities can be permitted to offer the same programs. Some institutions can acquire distinction as comprehensive universities ; others can aspire to excellence in particular specializations, e.g., engineering, agriculture, or the arts. How then do we moderate competition among institutions, reduce duplication, and yet liberate individual campuses to seek distinction on their own terms, encourage faculty to devise research agenda, and respond to students with particular needs and interests? Research on governance provides as yet no clear answers to such questions. Cross-national comparative research and data gathering promise fruitful lines of inquiry.

2. Curriculum

As we know, no issue-beyond our salaries-rivets faculty members' attention more quickly than questions about curriculum. Efforts to change degree requirements, add or delete programs, or redesign courses threaten our academic homes, the meaning of our professional lives, and possibly the number and quality of students in our courses. Curriculum policy always touches sensitive faculty nerves and often moves us to engage in the crudest forms of political behavior.

These days curriculum issues haunt higher education world-wide. They can be traced to two principal sources : (1) the knowledge explosion that has opened new fields of inquiry and accelerated growth across disciplines, especially in scientific and technological fields ; and (2) economic market conditions that have rearranged patterns of employment opportunities, national manpower training priorities, and the cost-benefit ratios of various academic majors. These two developments are closely related. They have combined to sharpen economic influences on curriculum decisions, but the effects are not always predictable. Recent developments in India and the United States can be used to illustrate this point.

As its new national policy suggests, India expects to launch its drive for higher

education reform on two fronts. First, it intends to expand the student population by drawing adult learners into vocational training, short-term courses of study in community-based institutions, and extension programs beamed electronically to remote populations. These programs are expensive, not only because of equipment and construction cost, but also because of the necessity of what might be labeled "pre-investments." In predominantly rural states, where educational needs are most profound, one may find that 40 percent of the area has no electricity. (Government of India, 1986) This situation obviously must be corrected before technology can be used to implement the programs. Doing so will be costly. Second, India wants to strengthen undergraduate programs in scientific and technical fields and to reduce its reliance on foreign universities for graduate training. These too are expensive undertakings. Both efforts require the reallocation of resources within higher education and strategies to dissuade students from low priority, if prestigious, programs and into those that are more in line with national aspirations. Imagine trying to convince a student whose test scores qualify him for the study of law that he should enter a two-year vocational training program. Both objectives also place traditional programs in the arts and humanities at risk because in the reallocation of resources they are the predictable losers. While the debate over these curriculum issues has been intense, it has been aggravated by job market conditions. India has an under-employment problem. Entry level positions even for graduates in engineering and computer science are not yet widely available. Thus the immediate return on the proposed investments in curriculum reform are dubious, and it is not clear that India's economy is strong enough to await the arrival of long-term profits that in fact may never appear.

Recent developments in the United States illustrate another complexity in higher education curriculum reform initiatives. Like India, my country intends to sharpen its competitive edge in the world economy, and this ambition has given greater prominence to graduate and undergraduate programs in the sciences, mathematics, and related technical fields. But the curriculum debate has also focused on the effects of the knowledge explosion in the humanities and the social sciences and on what might be called the "internationalization" of American higher education. For economic reasons, we encourage specialized studies in foreign languages and Eastern cultures, but there has been a strong reaction against the introduction of cultural pluralism within the general curriculum.(See, e.g., Hirsch, 1987 ; Bloom. 1987) Educational traditionalists and political conservatives alike have sought to strengthen a core curriculum focused on Western Civilization. Their goal seems ironic, in light of world economic pressures on universities, but it also runs counter to demographic realities in the United States. Except for our native peoples, we are literally a nation of immigrants. Our claim to uniqueness rests in large measure on our pluralistic character. There are thus compelling political reasons for maintaining a core curriculum that reflects this cultural diversity. But recent research in history, for example, which has generated new knowledge about our varied traditions, adds the weight of scholarship to efforts seeking to expand the core curriculum beyond a focus on our European origins.

These two cases illustrate the complexities of the current curriculum debate that is occurring in countries around the world. Faculties, institutions, and governing bodies

confront imperatives to make judgments about the relative value of programs and institutions. Graduate and undergraduate education are being weighed against each other. Institutions and faculties find themselves increasingly held accountable for program quality and teaching effectiveness. National priorities, economic aspirations, new knowledge, ubiquitous limitations on budgets, and entrenched ideologies not only shape such curriculum decisions, they frame the debate itself. But curriculum issues are not merely jurisdictional disputes among competing faculties and institutions or containable quarrels within the higher education communities of our respective countries. They raise questions about the fundamental purposes of colleges and universities and the relation of these venerable institutions to the deepest values that sustain civilized society. Their importance requires the attention of our best minds and noblest sentiments. Short-term answers, forced by economic considerations, will likely have long-term cultural effects. To paraphrase the poet W.B. Yeats, what will be the educational center that holds, that keeps things from falling apart? (Purves, 1988)

3. Student Access and Educational Opportunity

The issue of student access to higher education concerns countries differently. Some express confidence in the selection criteria and processes they have in place. Others, Egypt, for example, fault their admissions procedures because they tend to bring students into programs which cannot promise employment opportunities to graduates. As you probably know, in my country access to higher education has long been a source of controversy, and debate over admissions criteria arises regularly. But despite our various national perceptions, access to higher education remains for all of us a policy matter of fundamental importance. Like curriculum, it has strong implications beyond particular institutions and even the system of higher education as a whole. It is the initial means, at least, by which individuals are selected for particular careers and roles in society. It is a mechanism for distributing economic opportunity, status, and advanced knowledge. Access to higher education is access to various forms of power. It carries both social benefits and social costs.

We limit access to colleges and universities directly and indirectly. Both methods require analysis because each has subtle effects. The most obvious direct means of controlling access occurs in the form of scores on qualifying examinations. We use such devices as ways to guarantee student quality. Whether they measure aptitude or achievement, the test scores give us relatively objective bases for judging academic promise. Furthermore, they can be used to justify decisions by particular institutions to set minimum levels of acceptability, and these criteria become in turn badges of institutional status. An American high school student who earned an ACT score of 19 would be an unlikely candidate for admission to Stanford University or the University of Wisconsin, Madison, which tend to look for scores on this test above the 23-25 range. (Berdahl et al., n.d.) But he would probably be acceptable at Wisconsin's Stephens Point campus, which regularly admits students with ACT scores below 20.

This example suggests another use of qualifying examinations. They produce tangible

criteria for judging academic ability or achievement, but they also function as mechanisms for managing access. (Heyneman, 1988) Testing itself becomes an elaborate ritual through which the various participants—students, families, institutions, and test makers—accept and defer to each other's special role. Students acquiesce in an extended preparation period which also predisposes them and their families to acknowledge the legitimacy of scores as criteria for determining their futures. Universities acquire socially accepted means for discriminating among students, and by establishing cut-off points, they are able to define themselves and thus exercise autonomy. For their part, test makers find steady employment.

Depending on the type of examination used-achievement or aptitude-testing produces other effects as well. The SAT is widely used in the United States in part because it is thought to be resistant to coaching influences. Supposedly, its objective measure of aptitude weakens the advantage of students who attended high quality secondary schools over their less fortunate peers. But these characteristics also weaken the SAT's use by teachers who want to help students learn from the testing experience. Apparently, these limitations of the SAT led Japan to abolish its use in 1954. (Hidano, 1988) The Japanese wanted a coachable test, and their current examination system has an important side effect. It rewards diligence. The type of test used teaches Japanese children that hard work can lead to higher scores, to a more prestigious university, and ultimately to a more honored position in society. I offer this example to indicate the variety of functions performed by qualifying examinations and the complex social roles played by higher education admissions.

But access to colleges and universities is also determined by indirect means. Some of these have been referred to above. Varying levels of institutional prestige signal the fact that access to higher education can have ambiguous meanings. Students admitted to a two-year or regional college have been denied access to a world class university. Different educational and life opportunities will probably follow. This is another way of indicating the sorts of power distributed within higher education systems. The clearest example of shaping access indirectly, however, is the influence of geography. In nations with large agricultural areas, access can be a function of the proximity of any institution, regardless of its stature. In such a case, family wealth is also a factor in that limited personal resources disallow student travel to distant colleges. These sorts of considerations have apparently convinced the Indian government to take higher education opportunities to people rather than pay the price in social alienation of waiting for those with sufficient resources to come to existing institutions. In the United States we see another factor related to geography that affects the accessibility of higher education. Testing scores reveal that children in low income urban neighborhoods do not fare as well in mathematics as those in suburban communities. Until recently, students in the southeastern part of the United States read less well than those from the northeast, midwest, and west. (La Pointe, 1988) For these students, place of residence seems to be a predictor of their preparation for higher education.

Indirect limits on access are particularly troublesome because they operate in less

visible ways and as a consequence are more resistant to modification. Arbitrary or unfair actions may go unnoticed for long periods of time. But both direct and indirect modes of access to higher education have effects that transcend particular institutions and the system as a whole. They become predictors of social disaffection and cohesion ; they distribute social rewards and help define marginality and alienation ; and by including some and excluding others, they shape the pool of developed talent available in a society. Access distributes and restricts educational opportunity. And, of course, if the employment market cannot absorb those who complete our programs, access in any form merely postpones social unrest.

Most countries are struggling with issues related to student access and educational opportunity. Questions about the fairness of various testing systems persist. None of us would endorse arbitrary judgments on student admissions, and yet in most of our countries we can detect positive correlations between family social status and wealth and access to higher education, particularly if the analysis is limited to our most prestigious universities. Students who live in areas remote from large population centers also seem to fare less well in the admissions process than their more urbane peers. Here again is a matter of shared concern that can be profitably addressed through international collaboration. Some work has been done, but the area of ignorance and uncertainty remains large.

4. The Promise of Partnerships

Partnerships among universities and colleges and between institutions and business represent strategies for contending with the economic, political, and cultural complexities besetting higher education today. They also pose risks we should avoid. Partnerships imply mutual interests and collegiality. Those with business, for example, many threaten to emphasize economic goals to the detriment of such academic values as commitment to basic research. Not all new knowledge has immediate applicability, nor should it be expected to enhance economic productivity. There is such a thing as the soul of the university, and we should see to its defense.

But my principal aim in rehearsing this selected list of issues confronting higher education today has been to make a case for international partnerships. Again, there are risks that we ignore at our own peril. Collaborative research, information sharing, international conferences, and exchanges of faculty and students offer resources for contending with unique national problems. We can learn from each other and strengthen our own universities in the bargain. But the aims of international partnerships do not include efforts to render our systems more alike. Uniformity would not well serve our individual systems, and it would have stultifying effects on the quality of higher education worldwide. International partnerships should not deter national goals to strengthen graduate education. Each of us needs world class research universities. Nor should we permit elements of artificial partnership to infect our collaborations. The problems of higher education that lie ahead know no national boundaries. None of us has answers which we only have to bestow on the others. No missionaries or neo-colonialists are needed. Rather, we need each other as authentic partners to share in conceptual labor, to test

our theories and validate our data, and to provide external perspective on national policy formation. As scholars and academic leaders, we represent a new breed of educational diplomat, one that takes intense interest in the expanded province of its own commitment-the quality of higher education in the 21st century. But the scope of our self interest now includes the world.

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Educational Exchange in the Pacific-rim Age

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In this year, the year of the Seoul Olympic, the capital city of Korea has served as a venue for many international conferences including the World Congress of Cockroaches. The famous cockroaches representing all the nations of the world came to Seoul to dicuss the crucial question of their survival, for the increased use of insecticide by the human beings have massmurdered them by the millions every day. Heated debates rocked the Congress for weeks without finding answers to cope with the grave situation. Suddenly a young cockroach from the Middle East stood up and, clearing his voice, spoke up :

"Dear fellow cockroaches ! I have a wonderful idea. Why don't we, cockroaches, transform ourselves into dragonflies ? Then, we can fly into the sky when the cruel human beings spray insecticide upon us."

Every cockroach applauded this wonderful idea. So a resolution was swiftly drafted and unanimously adopted by the Congress. Jubilant was the mood of the gathering. Finally at last, they found a solution. But an old cockroach stammered, "the idea of transforming ourselves into dragonflies is wonderful, but how to do it ?" Cockeyed, the chairman of the Congress reprimanded the old cockroach, "the question of how is a practical matter which should be tackled by individual cockroaches themselves. This Congress should not deal with such small matters."

I truly wish that our meeting here is not going to be like the World Congress of Cockroaches.

1. The Emergent Pacific-rim Age

Our decade, the 1980s, has witnessed a host of metamorphic changes. The "third wave" changes are characterized by new electronics, lasers, genetics, alternative energy, ocean science, space manufacture, ecological engineering and eco-system agriculture. Among these changes, one singularly conspicuous change that overshadows all others is the shifting center of world affairs, namely the emergence of the Pacific-rim age.

As early as 1902, John Hay, then Secretary of State under President Teddy Roosevelt, made a prophetic statement saying "Western history began with a Mediterranean era, passed through an Atlantic era, and is now moving into a Pacific era." In 1908, Homer Lea, an American writer, predicted that the pacific would eventually replace the Atlantic as the main theatre of international trade. In 1945, just before the surrender of Japan, General Douglas MacArthur, SCAP Commander, echoed them by saying that "that Pacific would eventually become an American moat."

Farsighted and sagacious as they sounded, the predictions of these American leaders did not become a reality in the post World War II era. The Atlantic remained staunchly as the hub of global activities as evidenced in the Truman Doctrine, the Marshall Plan,

and the formation of the North Atlantic Treaty Organization. The outbreak of the Korean War in 1950 and the prolonged Vietnamese War from 1964 did not change the picture. The Atlantic Community and the Warsaw Pact counterbalancing each other dominated the minds of world leaders continuously.

However, the shift of the global balance was in the making, quietly and subtly, in the economic plane. In 1982, I was invited for breakfast by Senator John Glenn of Ohio. "The Pacific age is grandiously opening," he said, with the total volume of American trade with the Pacific-rim nations becoming bigger then that with the Atlantic nations." As of 1960, American trade with the Pacific-rim countries was only 48% of that with Europe, but it had risen to 122% of American European trade by 1983. The total tonnage of cargoes shipped over the Pacific Ocean increased over one hundred times during the past four decades. Will the Pacific really become an American moat?

On the other hand, we know that the maintenance of American power over the Pacific has been seriously challenged by the rapid expansion of the Soviet naval power as seen in the growing strength of the Soviet Far Eastern Fleet. Will the Pacific become a bone of contention between the two super-powers?

That the United States and the Soviet Union will remain as super-powers well into the coming 21st century is indisputable. In terms of population, educational standards and the level of technological know-how, these two super-powers is formidable. Yet, it is equally clear that the Pacific Ocean will become neither an American moat nor a Soviet lake. The relative power of Japan and the NICS (the newly industrialized countries of Asia such as Korea, Taiwan, Hong Kong, and Singapore) has risen almost menacingly to the old status quo of the globe. Of late, Tahiland is racing to join the rank of the NICS.

As of 1945, the GNP of the United States constituted over 45% of the world's total productive power. But the US share of world GNP shrank between 1960 to 1986 from 34% to 25%, and in 1987, it again dropt to 22%. On the other hand, Japan's GNP as of 1951 amounted to only one twenties of America's, but between 1960 and 1986, her share of the world GNP rose from 3 to 12%. In the case of Korea, the income per capita as of 1960 was about $80, but today, it is nearly $3,000. In 1987, her GNP was 130 billion dollars, one third of that of China and her trade surplus was 9.6 billion dollars, the fourth largest in the world. The Chinese GNP is still small, but some futurologists think that China may catch up with the Soviet Union by 2000 and Japan by 2020. We can point the similar astonishing growth of national economy in the case of Taiwan and Singapore.

2. Historical Tasks Demanding Attention

The emergence of the Pacific-rim age is a complex phenomenon, far more so than the mere shift of the center of international affairs.

First, in the Pacific, a new international power configuration is in the making. Japan, China, and the NICS, along with Australia, demand more shares in the decision-making process of world politics. The two super-powers should learn how to treat other Pacific-rim nations as equal parterns rather than as their client nations. Washington and Moscow must become more sensitive to the resurgent neo-nationalism of the peoples living on the

Pacific-rim that arises not so much from resentment as from self-confidence.

Secondly, in the Pacific, the West is really meeting with the East, perhaps for the first time, on equal terms. Contrary to Kipling's oft-quoted dictum, "East is East, West is West, and the twain shall never meet," the meeting of East and West with their rich cultural and intellectual heritages may well pave ways to create a new world civilization. All the different heritages of the cultures of East and West may orchestrate a gigantic cultural symphony by playing their respective tones harmoniously.

Thirdly, in the Pacific, the North and the South shall meet. To bridge the growing gap between the "have nations" and the "have-not nations" the nations on the Pacific-rim should be forged into a community, perhaps, on the model of the Atlantic Community. The rich nations should be their "brothers' keepers." As the productive power of the Pacific-rim is expected to reach 55% of the total world productive power soon, it may be highly possible to create a "co-prosperity sphere" of the Pacific.

The reverse of these possibilities would be disastrous. Imagine a new power struggle between one of the two super-powers and Japan resulting in a new "Pearl Harbour." Imagine the Pacific-rim where the cultural heriatages of East and West continue to collide. Imagine super-rich nations on the Pacific-rim continuing to exploit their poor neighbors.

What is needed is the broadening of understanding among the nations on the Pacific-rim. Mutual understanding among them is esstential if they are to form a community of mutual prosperity. But how much do the Pacific-rim nations know each other?

3. Role of Education for the New Age

At this gigantic transitional period, the role of education has become increasingly important. Yet, education in most, if not all, countries on the Pacific-rim is in disarray, incapable of playing the role that it has to perform and falling short of maintaining its erstwhile status as a key prime mover of history.

In the case of the United States, *A Nation at Risk*, a serious report made by the US Presidential Commission at the early part of this decade, candidly pointed out that the American standard of education was in decline continuously since 1961. *In The Closing of the American Mind*, Allan Bloom argues that the state of souls in American students is impoverished largely due to the prevailing value relativism that closes the American mind rather than opens it. Nor does education do any better in the Soviet Union. In *Perestroika*, Mikhail Gorbachev admits the inefficiency of Soviet education in meeting the demand of the changing times and advocates a major educational reform.

Viewed broadly, the same can be said of education in Japan, Korea, and China. and China. In this decade, all three countries carried out educational reforms. The national councils for the deliberation of educational reform were created in Japan and Korea while China was trying desperately to restructure her educational system out of the chaos created by the Cultural Revolution in the Previous decades. Many innovative ideas have been incorporated into the new educational policies of these nations, but their results are yet to be seen.

Nor do we find education in Australia and New Zealand free from serious problems. If

they are to face challenges of the emergent Pacific-rim age creatively, Australia and New Zealand have to restructure their curricula to teach students what goes on in other Pacific-rim nations. The total volume of their trade with Great Britain is so much smaller than that with Japan, but their schools teach little about this rapidly changing reality.

At this point new question arises: "How much do the Pacific-rim nations try to understand other countries on the Pacific-rim?" I was a member of the Korean delegation to visit higher learning institutions in Australia and new Zealand last June. I was stunned to find my ignorance of these two countries. I was not even sure whether Australia was a big island or a small continent. Even now, I have no clear answer about this question. In spite of the fact that the volume of trade between Korea and Australia now exceeds 2 billion dollars, Australians know little about Korea except the stories of student demonstration and the coming Olympic. Something must be done urgently.

Therefore, educational exchange among the Pacific-rim nations imports much more than mere exchange of students and books. The accelaration of educational exchange among them will pave ways to create a new world civilization, lessen tension in international affairs, and help each nation to reform educational system. Therefore, educational exchange amongst us is an imperative demand of the times.

4. New Forms of Educational Exchange

In the past, students in the western and southern part of the Pacific used to go mainly to north America and Europe to study. It was a one-way stream. This traditional pattern still looks viable. But now, gradually educational exchange has taken a more complex pattern. In the field of science and technology, Japan and the NICS have succeeded in advancing high techs so high that even American students have become envious of them. Noteworthy is the elevation of academic standing of some major univerities in those countries. Highly eqipped, enjoying well-qualified faculty, graduate schools of these nations are willing to accept foreign students and scholars. The governments of these nations have taken bold steps to help build their higher learning institutions inasmuch as education is the prime engine capable of developing their nations.

Going one step deeper, we find that many American students, for instance, are interested in the study of the cultures of Asia, expecially in view of the fact that Japan and the NICS are invariably embeded in Confucianism. The old teachings of Confucius must have something to do with the work ethics of these nations. Due to this reason, plus many other similar ones, more and more students from North America and Australia are venturing to study Asian cultures.

On the other hand, the less developed nations on the Pacific-rim are eager to learn the way the NICS have developed their industries. Instead of high techs, they want to learn appropriate technology applicable to their stages of industrial growth. Probably due to this reason, Korea, for instance, is drawing many students from the Southeast Asian nations. Conversely, not a few students in Korea are interested in regional studies of other parts of Asia.

In June, six Korean educators representing 115 universities and colleges in Korea were

invited by the Australian universities to explore possibilities of promoting educational exchange between the two countries. I was privileged to tade part in the seminar and enjoyed visiting many educational institutions in Australia and New Zealand. I am sure that this kind of bilateral or multilateral approach will open more and more ways for educational exchange.

It is, therefore, high time for us to restructure and reshape our educational exchange programs.

5. Practical Suggestions

With this broad premise in mind, I now suggest a few practical ways and steps to promote educational exchange.

First, *STUDENT EXCHANGE*---- Unlike the previous practice of sending our students to other countries for a long period, sometimes exceeding five or seven years, I suggest to have them stay in foreign countries for a short period, perhaps two semesters. If two institutions are interested in carrying out this type of short-term student exchange, they should first conclude a credit exchange agreement. The receiving institution may provide room and board with an arranged host family for whom the exchange student is expected to give a certain degree of language lessons. The receiving institution provides a course of curriculum specially tailor-made for exchange students to meet his (her) academic needs. Students will pay their own travel expenses, and the receiving institution may help students to secure some on-campus jobs to help their expenses.

Secondly, *FACULTY EXCHANGE*--- In addition to the well established practice of sending faculty members to another country for a lengthy period for their additional degrees, I recommend the idea of having them stay in a host institution for a short period, sometimes for a week or for a month. The sending institution grants its sabbatical benefits to faculty members wishing to go overseas to spend a short time, and the host institution provides for them appropriate housing plus living expenses for the period of their stay in the form of salary in the case of a month-long stay or of an honorarium in the case of their week-long stay. They would spend two thirds of their time for teaching and one-third of their time for research or in pursuit of their academic interest. Two institutions involved in this kind of exchange will help faculty members to obtain travel grants from outside sources.

Thirdly, *EDUCATIONAL MATERIALS EXCHANGE*--- in the case of Han Nam University, the exchange of herbs, stuffed specimens of insects and animals, and minerals in its natural history museum with other universities shall be a welcome idea. Exchange of these materials will undoubtedly benefit both parties.

Fourthly, *JOINT RESEARCH AND PUBLICATIONS*---- In the fields of science, technology, socio-political problems, and humanities, scholars in our nations may be interested in conducting joint research activities, hopefully putting their findings into publication.

Fifthly, *JOINT SEMINARS*---- Highly recomendable in this line of thought is the idea of holding joint symposiums alternatively between the two nations or among many nations. Those scholars invited to read papers at these seminars shall also deliver special lectures at the universities and colleges of the hosting country. Music teams and short-term visits

shall also be exchanged in this manner.

In order to carry out these suggested programs, universities in our nations shall face many new problems. Interested in promoting international education should be advised to restructure their administration to facilitate educational exchange programs on a global scale by adding an office solely responsible for these programs.

To initiate and to pereate all these proposed programs, more funds are necessary.

In spite of all these foreseeable and unforeseeable problems, we, educators of the Pacific-rim nations, cannot sit still. By responding to these challenges more creatively, we shall open a new historical era which will pave ways for prosperity and understanding among the Pacific-rim nations.

6. Conclusion

We live in a complex decade of historical changes, almost unparalleled in history. Multifarious, multifaceted and multi-dimensional changes take place in all realms of human life simultaneously. Among them, one most noteworthy change that poses as a challenge to educators is the shift of the center of international activities from the Atlantic to the Pacific.

Now the question of "why" the Pacific-rim nations should accelerate the pace of educational exchange among themselves is clear, indisputably and abundantly obvious. But the question of "how" should be even more clearly defined. I believe that this imparative question of "how" has called this meeting today. I wish that this conference will not become as unproductive as the Seoul Congress of Cockroaches. Thank you.

International Cooperation Through Electronic Media

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One of the greatest innovation in higher education in the Asia-Pacific region today is the operation of the University of the South Pacific (USP). Known by many educators, USP is a university which was established under the agreement among 11 Pacific island countries, and is operated by international cooperation. For economic reasons, these remote and isolated island countries, such as, Tonga, Samoa, and Cook, are not able to afford their own colleges and universities. In other words, it would not be feasible for an island nation state, whose population runs only in the several thousands, to have its own institution for higher education. And yet, for such countries, highly trained manpower is the key for the socio-economic development. How to solve this problem has been one of the vital issues among islanders.

One solution, of course, was to send bright young people abroad for training. However, such a venture was not only costly but also often inappropriate. Thus, another alternative was designed ; the use of sophisticated telecommunication technology. Thanks to the cooperation rendered by PEACESAT, a communication satellite, university level instructions could be delivered to the islanders via satellite. The concerned island countries decided to locate the headquarter of USP in Fiji. Because of the nature and quality of the satellite, transmission of visual material is not possible, however, diffusion of voice is possible. Moreover, the channel can also be used for a two-way communication process. As a result, a student on Solomon island can ask a question to an instructor on Fiji and receive an immediate response. Students on Samoa and Tonga are able to join the same seminar. Considering the physical distance among these participating nations, USP's venture was a miracle, and the implication of their success is extremely indicative for the future image of education.

Traditionally and conventionally, the term "education" has been associated with solid school buildings with classrooms where instructors teach various subjects to their students. From primary school to univeristy, "education" has been perceived as an act done in a specific physical set-up ; blackboards, desks, chairs and the presence of teachers and students. This still holds true in most areas of education.

However, USP proved that distance education, despite the vast Pacific Ocean, is possible, and that new international cooperation of the university level can be successfully done through electronic media. Of course, there are many shortcomings in such indirect teaching, and further technical innovationa are required. But, it should be noted that USP demonstrated a new model for international cooperation in the sense that education across the border can be materialized by means of high technology of today.

International cooperation in higher education in terms of the exchange of scholars and students has been extremely successful and fruitful, especially after the 1950s. With the introduction of the 747, coupled with programs such as Fulbright scholarships and aids rendered by various Foundations, hundreds and thousands of students and scholars were thus able to travel from one country to another. In the case of Japan, more than 2000 Japanese graduate students earned their Ph.D in the United States and elsewhere. The same probably holds true in Korea. These young scholars and educators are the hope for development. It is true, also, that many scholars from the West were trained in East Asia and South East Asia. The experience of studying abroad not only enriches and widens the scope of scholars, but it is also beneficial to the nations to which they belong to. At least "internationally oriented" persons are the key for the development of a nation and for a deeper and better understanding among nations, which will lead to more stable international relations and peace in the long run.

This exchange of scholars and students must be further encouraged in the future. In the case of Japan, the government recently decided to invite one hundred thousand foreign students each year so that, hopefully, Japan can be better understood by these future leaders of tomorrow. And similar new programs are emerging in other countries, too. The transfer of credits among universities of various countries, for instance, is desirable and is presently being practiced. After all, by definition, universities are the institutions of which the ultimate goal is to explore the universal values and truth.

However, as stated at the outset, media is another means to achieve the same goal. Though the transmission capacity of lectures and exchange of ideas through telecommunication is relatively advantageous in comparison with the conventional classroom instruction, the cost effectiveness of higher education by media is tremendous. At the same time, teaching could be much more interactive since telecommunication provides multiparticipation opportunities to the students. Moreover, for those who are not able to commute to school because of such reasons as being physically handicapped, can easily have access to a higher education by this method. Above all, distance education, though not as large in scale as USP, has an equalizing effect in the sense that education can be given to anybody regardless of his/her physical location. At the same time, such transmission of university level lectures can give more flexibility on the part of the lecturers. As early as 1960s, for instance, Margaret Mead, a renowned American anthropologist, accepted telelectures in the United States. At that time, Dr. Mead was unable to leave her home because of her health. But through telecommunication, she was able to talk to the students all over the country, and her videos could be used by academic institutions outside the united States.

That is why many countries in Asia and the Pacific are concerned with distance education as part of their education policies. In Korea, for example, Korean Air and Correspondence University demonstrated the great potential of distance learning, and those Asian nations who have similar interests organized Asian Association of Open Universities (AAOU) in the fall of 1987. And, surprisingly it was reported that in Asia, more than 2.5 million peoples together were learning through media.

At present, AAOU members are engaged in their respective domestic education, but they are looking forward to seeing future opportunities for international cooperation through media. Unlike regular educational institutions, distance education materials, either by audio or visual, are stored in tapes or in disks, therefore, the materials can be easily transferred from one country to another. As a matter of fact, early in July 1988 the executive committee of AAOU adopted a resolution to extablish Asian and Pacific Regional Resource Center in Bangkok so that each participating institutions from Pakistan to Korea, Indonesia to Japan can have, at least, access to available teaching materials, and hopefully, opportunities of program exchange and joint productions in distance learning.

Indeed, a good example of such international cooperation was materialized in 1987–88 when member institutions of Korea, Thai, and Indonesia assisted the production of a course "Asian Societies ; Rice Culture" for the University of the Air of Japan. The University of the Air sent its crew along with professors to those countries and host institutions helped with providing information and local manpower. The video materials thus produced are being shared by other countries. For instance, if University of Indonesia wants to use certain portions of the video, they can do so since the video materials are common property of participating countries. The program, which is now being broadcast in Japan was not possible without the assistance given by the sister institution of the University of the Air.

Of course, there are many problems and obstacles in international cooperation through media. For one thing, international copyright ambiguities must be cleared. Needless to say, any portion of a program is copyrighted by an institution, and by the international copyright agreement, other institutions would have to get permission and charged a fee from the original producer, and copyright experts are always warning the difficulties of international transfer of copyright, especially when the program is to be aired.

Moreover, even if the copyright problems are settled, depending on the programs, course produced in one country may not be in another country because of policy related reasons. For example, such programs as mathematics or introductory physics can be universally used, since such disciplnes are, by definition, objective and neutral, and therefore are acceptable by most of countries. However, political science, sociology, or philosophy which are thought to be appropriate in one country cannot be accepted by another because these areas have, more or less, ideological implications. Thus, it is too optimistic to think that teaching materials in distance education can be universally diseminated all over the world. Educational policy and communication policy of each nation-state should be carefully respected in such program exchange.

However, as stressed in preceeding paragraphs, there are great potentials in international cooperation through media. A Nobel Prize winning scholar, for instance, can speak to millions of students, professionals, and laymen of any country through mass media. It could be a part of university instruction, and at the same time, it can serve as general social education.

One may argue that education through media lacks a "feedback" system. In other words, the viewers or listeners cannot submit their questions/comments to the lecturer on the TV

screen. That is quite true. In conventional classroom situation, a student is always free to ask questions to his/her instructor who responds immediately. Also, the instructor can grasp the "atmosphere" of a class room and react to the implicit reactions of the students. In contrast, an instructor in distant education is obliged to talk to invisible students of which number may be in the hundreds and thousands. The "feel" of reaction is nil for a professor who give lectures through TV camera in silent studio. It is natural, in this connection, that many, if not majority, of traditional university professors are skeptical about the possibilities of distance education through media. However, thanks to the advancement of communication technology, such as fiber optics and ISDN(Information Service Digital Network), a two-way communication and even a multi channel communication system is possible regardless of physical distances. The success of USP introduced at the outset is a good illustration of such possibilities.

Universities throughout the world have been engaged in international cooperation by means of exchange of scholars and students. Above all, universities have been the places where exchange of intellectual information is practiced as a part of daily routine. For example, any university library is stocked with books written in various languages which were published in many countries. Scholars and students are privileged to have access to these huge stock of human wisdom. It is said that there is no national boundaries as far as universities are concerned.

Academic persons are those who can read and learn from the books written in foreign languages, and that is the obvious reason why foreign languages are assigned as a part of higher education curriculum. For example, in social science, such names as Max Weber or Adam Smith are known by every student of every university who major in the discipline, and the writings of eminent scholars are often translated into the languages of respective countries. Human Knowledge, regardless of its origin, must be shared by everybody, and that is the basic ideal and philosophy which support institutions of higher education.

The same spirit is inherited in the age of electronic media. There is no reason, in this connection, why audio-visual materials produced in other countries cannot be stored and used by millions of students. Tapes are, in other words, a new form of books. And as was discussed already, these new books are now available, and depending on needs, the books are ready to be on the air for distance learning. International cooperation in universities through conventional books were practiced for centuries. "New books" have the same nature and mission.

Looking at these technological innovations in electronic media, especially in the area of telecommunication, it should be emphasized that Asia and the Pacific region is one of the richest part of the world. Japan led the "communication revolution" since 1970s, and Korea, Singapore and other NICS nations are now taking over hi-tec innovations, and if the gross products of these electronic products are aggregated, more than 50% of world market is in the hands of Asian countries. Coupled with amazing high literacy rate of these countries, we are now coming to the new age of higher education, and we Asians are in a fortunate position to demonstrate a good future-oriented model not only in

university education but also in distance education across the countries. Our position in 19th century was "backward" and "underdeveloped" nations. But today, the tide is changing. With technological advancement and its clever utilization, the countries of Asia and the Pacific can achieve international cooperation in most imaginative way and contribute to the rest of the world in 21st century, or even earlier.

Comments on Dr. Lee's and Dr. Hidetoshi's Papers

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The two papers presented in this session compliment each other rather nicely. The first one by Dr. Won-sul Lee has touched on the basics and principles of international cultural exchange in the context of university education and provided us with a great deal of historical insights related to the subject. The second paper by Dr. Kato Hidetoshi is very informative in terms of the concrete programs of international cultural communication on the higher educational level, and has introduced us to various technical insights concerning the programs.

My comments, therefore, are not directed to the papers as much. Instead, I should like to offer a few observations regarding the nature of international cultural exchange or communication, with specific reference to the role of university education.

Historically, cultural information and human knowledge have moved around the globe, over the rugged mountains and across the wide oceans. The ideal goal of such international communication, of course, is to achieve a "free flow"of knowledge and information across the cultural boundaries. And yet, we could identify two major historical tendencies that have hindered the free flow of culture.

First, as the main obstacle on the international scale, one notices the problem of "tilted" acculturation. Acculturation as a generic concept implies bilateral or multilateral cultural contact on an equal footing. Nevertheless, the historical reality has demonstrated that cultures usually flow "down" from higher or stronger societies to lower or weaker societies in terms of technical know-how, economic wealth, and military process. In the process of world-wide modernization originated from the West, this tilted acculturation, in combination with ethnocentrism couched in nationalism, has taken on the character of cultural imperialism.

Second, as the form of internal obstacles, certain selectivites have operated hindering the free flow of culture. Faced with the surge of international acculturation, each society puts up some resistance or, if acceptable, makes some selection in absorbing the newly intorduced cultures. When national interest is at stake, the receiving society makes political selection. But at the same time, acculturation may be checked by cultural selectivity involving religio-ideological residues. These may be labeled as the principle of political and cultural selectivity. Even if resistance is overcome or other selections occur, the receiving culture may still be unable to absorb the new elements so readily. This is due to what may be termed cultural preparedness. In the process of modernization, one strong selection tendency has been preference for the technical and tangible, over aginst the intangible or "the soft" culture.

To overcome these obstacles, one should adopt a basic principle of true cross-national cultural exchange, on the one hand, and should be able to offer concrete programs of

practical nature, on the other. Without a free flow of information on a par with one another, a genuine cultural exchange is impossible. Furthermore, a true cross-national cultural exchange entails deeper cultural understanding in its substance. In order to promote this kind of international cultural exchange, therefore, the university by nature is the central institutional context.

In addition, such communication requires language ablility. For this purpose, universities could develop various multi-lingual programs, utilizing divese electronic media and technologies. In the context of the Pacific Rim, it would be useful to develop and disseminate language programs of the region among the Pacific nations.

The best way of enhancing cultural understanding including language learning is first-hand experience of the culture through some sort of "Live-in" programs, such as the Peace Corps of the United States.

As a poet once wrote, beauty is "unity in diversity and diversity in unity." Cultural diversity should not be undermined in the process of cultural exchange. But immersion into the culture is a must for a genuine cultural exchange. For a true cultural exchange, in turn, understanding of the culture in depth is necessary. For that purpose, training in languages is the first step. Universities can play a crucial role by providing such programs in order to promote genuine cultural communication and cooperation.

Cooperation of Higher Education with Industry and Research Institutions : The Case in Science and Technology

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1. Simplistic View

A higher educational institution provides undergraduate and graduate training programs and produces graduates with batchelor's, master's and doctoral degrees for the society. Industry is the sector which conducts economic activities by providing materials, products and services. The health of industry is directly connected to the welfare of the society and the nation's competitiveness in the international arena. Research institutions are those which carry out basic, applied and commercial research and development activities.

However, it should be pointed out that the real world is much more complicated. These sectors carry out broader overlapping scopes of activities through which their relationships develop dynamically. A higher educational institution does and should have active research programs closely integrated with its instructional activities and often provides valuable technical and advisory services to industry. Industrial organizations also operate its own research laboratories and carry out on-the-job and after-the-work training programs. Particularly, competent engineers are products of good industrial organizations which have well established engineering systems. Research institutes are often the places where new knowledges is transmitted through lectures, workshops and symposia. Therefore, higher education, industry and research institutions complement one another and are highly connected through professional activities.

The inter-relationships among these sectors vary with time and economic developmental stages. In a number of developing countries, we observe that these sectors are connected very weakly. Instead of cooperation, we find isolationism and antagonism. Academic institutions may easily retreat themselves into ivory towers and try to establish their own green pastures separate from the society. Research institutes, particularly national research institutes supported by the government, tend to respond to the funding agencies rather than industry and the society. Bureaucratic hierarchies set the research priorities and fund allocations. Industrial firms are more connected to their foreign collaborators for training their specialists and acquiring technologies. Even in developed countries, we notice that industrial firms try to have their own educational and research capabilities.

However, these three sectors should realize their own limitations and search out to help one another. Economic progress either accelerates or decelerates such interactive manuevers. This is why the simplistic view, however they might be useful in presenting the problem, must be taken with caution and reservation. We should look into the problem without any pre-set notion and identify the outstanding issues, before we formulate options for action. In this paper, some of those issues are identified from the view of higher

education. We focus on the case of science and technology.

2. Outstanding Issues

Issue No.1 : A higher educational institution is an autonomous, integrated organization of learning, research and intellectual services.

The primary goal of higher education is to develop an ability to perform leadership roles in various aspects of social life and to contribute to national development and the prosperity of mankind(Presidential Commision for Educational Reform, 1987). Institutions of higher education are charged with three main functions education, research and service. With the advent of a highly industrialized and technical society, there will be increasing demands for high-level specialists. Therefore, providing education based on relevant curricula and instructional methods remains to be the most important function for junior colleges, colleges, universities, and graduate schools. The faculties and administrators running these higher educational institutions should be free from rigid government controls and regulations. Self-regulation and peer pressure for excellence should be the guiding force for these institutions. In order to operate relevant and up-to-date curricula, research is essential and faculty members should carry out research as a regular activity not as an extra-curricula activity.

We should go one step further. Research should be a part of curriculum. Advanced students should be encouraged to participate in research activities. The advance of the technological information society will increase intellectual content of daily lives. The society will increasingly seek after the intellectual services higher educational institutions. In Korea, we recently just completed a review of our educational system. One of the final conclusions is that our nation needs a fundamental reform of the higher educational system. The goals and functions of higher educational institutions should be revised to meet the broadened educational ideals and emerging needs. In essence the review calls for transformation of our higher educational institutions into more autonomous and integrated entities for teaching research and intellectual services.

Issue No.2 : Higher education, industry and research institutions must cooperate together to encourge creative basic research work and continued technological innovation, which are critical elements for economic efficiency and industrial competitiveness.

Sound basic research is critically important in an era when international competition increases the industry's need for scientific advances. Universities are regraded as the main performing ground for basic research while national research laboratories are primarily responsible for applied research and large projects. Therefore, cooperations among universities, industry and research institutions should be strengthened to enhance the flow of information. In advanced nations, the government is the leading supporter of basic research work. For example, about 67% of the basic research funding in the U.S. is provided by the federal government ; the remainder is provided by the industry (17%), universities (10%), and other non-profit institutions (6%). In other OECD countries, we also observe

that the government is the primary sponsor of basic research, which is principally carried out by the academic institutions (Table 1).

The large goverment's role stems from the nature of its pay-off ; while basic reasearch contributes to the long-term public good, the results are often too uncertain to be undertaken by industry. Funding of basic research can not be sustained if it depends on the pure commercial incentives of business firms or the financial capabilities of higher education. The government must maintain a continuing committment to basic research in order to provide the necessary underpinnings for technologial innovations. In order for

Table 1. Comparative Data on R & D (1981–1984)
(Percentages)

	US	Japan	FRG	France	UK	Sweden
(1) R&D Expenditures by Higher Education						
Government	73	57	98	99	81	92
Industry	4	1	2	1	3	3
Higher Education	18	42	–	–	9	1
Non-Profit organization	5	–	–	–	6	4
(2) Total R&D by Funding Source						
Industry	50	64	55	42	42	57
Government	47	26	41	57	49	40
Other	3	10	3	1	8	3
(3) Total R&D by Perfomer						
Industry	72	62	70	57	61	67
Government	13	10	14	25	22	7
Higher Education	12	24	16	16	14	27
Private Non-profit	3	4	–	1	3	–
(4) Total R&D by Character						
Basic Research	13	14	22	21	12	23
Applied Research	24	22	78	33	25	17
Development	64	61	–	46	63	60
(5) Basic Research Expenditure by Performer						
Higher Education	57	61	60	67	55	88
Industry	19	26	18	9	13	8
Government	16	11	22	22	30	4
Private Non-profit	8	2	1	3	2	–

new technology to enhance economic growth and productivity, it must be commercially applied. Much new technology is created in university laboratories, government labaratories and industrial research laboratories. The flow of technical development goes from basic to applied to product design research. It is vital to expedite such "vertical" transfer and adaptation of technologies. In order to maximize its contribution to economic productivity and competitiveness, we must strengthen cooperative mechanisms and channels among higher education, industry and research institutions. We have to look into ways and means to improve the cooperative mechanisms. Joint research projects, exchange of personnel, complementary funding, consulting services are but a few well established methods. In addition, studies for identifying new methods of transfer would benefit the flow of information and technologies.

Issue No.3 : Highly trained human resources are the most valuable economic resource for the nation. To ensure that the workers are adequately educated and trained, higher education institutions should be actively involved not only in formal degree programs but also non-degree programs including training and retraining at all high levels.

Responsibilities for meeting the educational and training challenges may vary depending on the actual needs. Sound college educaton and competent graduate education programs are the cornerstone for developing good human resources. The government is responsible for overseeing the quality of formal education and, in many instances, it helps higher education through providing funds and institutional support.

In addition to formal education, workers in this fast changing world need remedial education and practical training. Traditionally, industry has been responsible for such non-formal education. At a much less scale, research institutes are involved in educational activities. Since most of specialists are expected to switch their areas of speciality or enter into newly created fields during their careers, non-formal or continuing education is expanding rapidly in this technological society. In developed countries, many higher education institutions are rapidly increasing the number of short course, summer training courses, non-degree programs, industry-academia cooperative programs, topical symposia, etc. Many forwardlooking universities are dynamically responding to the need of the industry and they do so in cooperation with research institutes. Such situation is more evident in the field of science and technology partly due to the increasing importance of science and technology in the societal activities and partly due to the accelerating pace of development in science and technololgy.

Issue No.4 : Industry can be of assistance to higher education and, more importantly, to its own long-term interests by increasing its financial support of education.

The world market is gradually transforming into a single unified open market. Although the sentiment for protectionism may slow down the process, many industrial sectors already operate on the international competitiveness.

The business community must bear the burden of maintaining, improving and revitalizing

industrial competitiveness. In order to keep its competitiveness, the industry continuously reexamines its long-term comepetitive viability for planning investments in human resources, technology development, and equipmment and facilities. In the long-term view, industry should emphasis on the supply and development of the professional specialists including scientists and engineers.

The industry should support higher education in a number of ways. First, industry can replace those out-dated equipment at univerities with new, sophisticated equipment. Students trained with up-to-date equipment can be much more valuable to industry. Industry will benefit itself by a greater use of academicians as consultants. This statement also applies to the specialists in the government laboratores. Joint research projects among industry, higher education and the national research institutions are a well known methodology for the cooperative activities. Sponsoring students with fellowships, scholarships or assistantships is a time-proven instrument. Greater support for university research, especially in neglected non-proprietry areas is strongly urged. The industrial sponsorship of professorial 'chairs' is another way of assisting higher education. Chair professorships encourage unhibited research work or can prove vital in opening new areas of speciality. Industrial support is vital to private educational institutions which have weaker governmental support. The educational institutions should be viewed as a national asset whether they are public or private. The need for external support is greater for private schools.

Issue No.5 : In order to facilitate cooperation with industry and be more relevant, higher education should take initiatives in broadening its educational scope and rearranging its priorities.

The recent innovations in higher education emphasize cross-disciplinary approaches. The traditional disciplinary education and research are getting out of touch with the industry and frontier research work. Techniques are borrowed from other fields and methodologies of one discipline are transferred to other areas with greater successes. Such cross-disciplinary fermentation occurs not only within science and engineering but also between management and engineering, social sience and natural sciences, liberal arts and social sciences, ets. Higher education should take bolder steps in encouraging inter-disciplinary and corss-disciplinary programs. For example, business schools should expand their teaching and research or the elements of management that are fundamental to effective industrial R&D, technological innovation, high productivity and high product quality. International programs can be strengthened in the areas of industrial, commercial, legal and financial practices and institutions in connection with science and technology.

Systems engineering is well-known to the practicing engineers and managers. However, there exists reluctance in accepting systems approach by academicians, who have intrinsic inclination with disciplinary approaches. At a number of higher educational institutions cross-disciplinary programs fared very poorly, whereas industry responded to such programs with enthusiam and interests. In the U.S., the National Science Foundation (NSF) is supporting a number of problem-oriented cross-disciplinary educational centers. Some of them are called engineering research centers (ERCs) and they are supported jointly by

NSF and industry on a long term basis. It is an innovative approach in reforming the traditional practices at higher education and seems to produce encouraging results(Cross-Disciplinary Research Committee, 1987).

Issue No.6 : Institutional innovations such as ERCs revitalize cooperation between higher education with the industry and research institutes.

Engineering Research Centers in the U.S. are designed to institutionalize academia-industry interaction and research on problems of industrial relevance with the cross-disciplinary focus and aggressive programs of technology transfer. ERCs are also to bring a cultural change to university campuses-from aloofness to relevance.

Innovation today is an organizational product. Higher education, industry and research community must emphasize collaborative and interdisciplinary activities focused on ultimate goals that have economic relevance. Industry supports ERCs with funds and hardwares. Furthermore, industrial personnel spend extended periods of time to conduct collaborate research with faculty members. Participants in the center activities clearly understand the goals of research, which requires a disciplined compromise between long term academic interest with short term needs of the industry. A successful operation pursues research with transitionable results. An ERC conducts a strong and diverse research program, defined in terms of demonstrable cases with founded milestones and clear long-range implications and importance. In addition, it has effective mechanicans for transferring technology. Furthermore, most importantly, it should be operated by highly capable engineers who have a strong sense of industry's objectives, operations, and working environments. institutional innovation such as ERCs is an approach to solving the prooblem of having to stay competitive in an age of rapid change. Since we are not sure what technologies will be crucial in the future and there exist uncertainties, cooperation of higher education with industry and research community should continue. To meet the challenge, higher educational system should consider experimentation with new innovative ideas.

3. Concluding Remark

Cooperation occurs when parties involved recognize clear incentives for working together. Higher educational institutions are seeking financial support from industry and wish to utilize facilities and expensive equipment of research institutes. Industry sees higher education as the source of highly trained manpower and a resource for consultation and information. Research institutes employ many of high level graduates from universities while faculty members are effective human resources for research. As the national R & D system matures, higher educational institutions may cooperate with research institutes not only on the project basis but also through institutional link-up. For examples, Associated University, Inc. (a consortium of the U.S. universities) runs Brookhaven National Laboratory and University of Chicago manages Argonne National Laboratory. The incentive relationship between higher education and industry or government institutes, however, is dynamic and can be cultivated. In a less desirable situation, there is little interaction among them and, to make it worse, there exists very few active initiators who

foster the relationship. In a better situation, there are concerns for mutual collaboration and set programs such as fellowships and research grants are established. In a more active situation, higher education is tied to industry and reseach institutes through management, joint projects, exchange of personnel, institutional link-up, etc. For active relations, "reachout" programs are needed to forster communication, interaction and cooperation. It is the responsibility of the leaders of these sectors that well-planned reach-out programs are set in motion. Cooperation among higher education, industry and research institutes is, however, ultimately based on personal interactions. Brains appreciate other brains. The ultimate pace of cooperation depends on the quality of experts in these sectors of higher education, industry and research community.

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A New Experiment in Academia-Industry Collaboration : The POSTECH/RIST/POSCO Case

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1. Introduction

The collaboration between institutions of higher learning, research institutes and industries is a matter of serious concern to all parties concerned. The research institutes we speak of here are a dozen or so government-financed public institutions where both mostly short range contract research for industries as well as somewhat longer range government-supported research activities take place.

On the heel of the successful transition from an agrarian economy to a "newly industrialized" economy, Korea acutely realizes the need for developing her own technologies in the face of increasing reluctance on the part of developed countries to sell advanced technologies to korea. It is slowly being recognized by leaders of industries as well as government officials that in order to develop our own technologies it is necessary to engage in full spectrum of research and development activities ranging from basic research, generic applied research, to proprietary technology development. The most critical element in this R&D effort is the research manpower. In this paper, I shall first give an overview of our current R&D status in terms of R&D manpower distribution and resource allocation, the projected demand for R&D manpower, and the need for vastly increased utilization of "idle" university R&D capabilities. This will be followed by a description of a unique experiment taking place in Pohang to bring together the three elements concerned : industry, university and research institute. Finally, I shall discuss some difficulties that must be overcome in order to achieve fruitful collaboration.

2. R&D Manpower Development

Korea's economic development during the past quarter century is often referred to as a "miracle". One can think of many factors contributing toward this development and argue about their relative weights. However, one thing that we can all agree upon is that the development of human resources was a major contributing factor. Korea, especially South Korea, is not endowed with a wealth of natural resources. Capital has always been a scarce resource also. However, Korea possessed a great deal of human resources - a large reservoir of literate and industrious people amenable to education and training. Learning has traditionally been an especially valued virtue in the Korean society. To make full use of the human resources was a cornerstone of Korea's development strategy.

The expansion of secondary schools as well as colleges and universities in Korea since the end of World War Ⅱ was a major factor favoring such a policy. To cite some representative statistics, the total government expenditure on education increased 40-fold from 1954 to 1985, representing 0.9% and 3.5% of GNP respectively. It should be pointed

out, however, that the government expenditure represents only 30% of the total spent on education, the remaining 70% being contribution of the private sector. There has been a phenomenal growth in enrollment at all levels during the 20-year period from 1965 to 1985. The total enrollment in colleges and universities grew from 105,000 to 932,000, while those enrolled in science and engineering went from 46,000 to 376,000 and the enrollment in graduate school grew from 900 to 18,000 for science & engineering students, a 20-fol-d increase during a 20-year period.

With a potentially rich reservoir of human resources, the Ministry of Science & Technology set out to formulate technological manpower development policies covering the entire range of needs. By the late 60's, the most serious task was perceived to be the development of R&D manpower.

A long-range forecast for manpower covering the period, 1972–1981, predicted an average annual increase of 18% for technical manpower while the employment growth rate for the entire labor force was projcted to be only 3% per year on the average. Against such an expansion in technical manpower need, the prospect for the supply of *adequately trained* scientists and engineers was indeed bleak as late as 1969. This was especially true for R&D manpower.

A 1969 survey showed that there were about 600 *full time graduate students* in both science and engineering in the entire South Korea scattered among 152 departments in 22 schools. Such a fragmentation meant that very few departments could offer a viable graduate program, and in most cases the graduate program was nothing more than an appendage to the predominantly undergraduate education. The training offered by these graduate programs were held in such low esteem by industries that the starting salaries for the M.S. degree holders were the same as those of the B.S. degree holders. In fact both were subjected to identical selection procedures with identical standards. Obviously something had to be done quickly both to increase the number of scientists and engineers with advanced training and also to upgrade the standard of graduate education.

In 1972, the government set up a new graduate school of engineering and applied sciences, Korea Advanced Institute of Science(KAIS), to meet this challenge. Created by a special presidential decree, it had features unique among Korea's institutions of higher learning. First and foremost was the provision that exempted prospective students from the compulsory 3-year military service and guaranteed full financial support while in school covering tuition, room & board, and incidental expenses. This ensured that the very best college graduates from the entire nation would vie for admission to the Instutute.

The government provided funding for adequate salary, more than twice that of existing universities, free housing, and state-of-the-art research facilities, enough to attract top-quality faculty from among overseas Korean scientists and engineers.

The government placed the new Institute under the jurisdiction of the Ministry of Science & Technology. This meant that the new Institute was freed from rules and regulations of the Education Ministry that often stifle innovative approaches in education. With the autonomy given, the Institute was free to establish its own admissions and graduation standards, curricula, allocation of research fund, faculty promotion and tenure

policy, and academic governance. Drawing students from top 1% of the nation's college graduates, with adequate time for research (average teaching load, one course a semester), and adequate research fund, research activities took roots for the first time in Korea's academic institution.

The presence of KAIS in korea's educational scene had an impact on the graduate education that can be only called "dramatic". It had a secondary effect on undergraduate education that was no less significant. Its impact on the salary of university faculty members is also noteworthy.

The multiplier effect of KAIS on the entire graduate education and the R&D manpower picture is readily visible in the following statistics. The number of M.S. and Ph.D. granted in science and engineering increased at a rapid pace : 754(1970), 1,282(1975), 2,662(1980), 7,502(1985).

The growth in university enrollment discussed above naturally added to the available R&D manpower, although the total figure is nowhere near adequate. A rough rule of thumb says that a devloped country needs about 2 R&D personnel per population of 1,000. According to this rule, we need to aim at 90,000 R&D personnel by the turn of the century if Korea expects to join the rank of the developed nations. The current figure stands at about 40,000. Not only is the total number inadequate, but the distribution of the available manpower is such as to preclude its effective utilization. Their distribution among various sectors as given below, where the share of total national R&D expenditures are also shown :

Table 1. Distribution of R&D Manpower and Fund by Sectors

		Industries	National Laboratories	Universities
Manpower	Ph.D.	251	1,105	6,564
	M.S.	3,594	2,998	7,165
	B.S.	15,151	3,051	1,206
	Total	18,996	7,154	14,935
Expenditures* (Million $)		608	229	49
% of Expenditures		68.5	26	5.5
% of Ph.D.s		3	14	83
Per capita Expenditure (in 1,000 $)		32	32	3.3

*Excluding salaries & wages.

(Source : Science & Technology Yearbook, MOST, December, 1986)

The table displays a severely skewed distribution of Ph.D. level research manpower and research funding : 83% of Ph.D.s concentrated in colleges and universities had access to only 5.5% of the total R&D resources whereas industries with 3% of Ph.D.s spent 68

% of the R&D resources. Even after making allowances for the difference in the nature of industrial and academic research, the discrepancies are much too great. One conclusion that can be readily drawn from these figures is that the academic R&D manpower is grossly under-utilized. In an economy whose success has depended significantly on human resources this represents an enormous loss that needs to be recovered.

3. Current Status of the Industry-Academia Cooperation

The cooperation between industries and academia is a major unexplored potential that needs to be tapped if we are to achieve the next stage of leap in our economic developnent that we hope will put us in the ranks of the developed nations.

This is not to say that there has been no collaboration between industries and academia. The industries have been providing scholarships and limited research grants and contracts to academic researchers. University professors have been providing consulting services to industries. Professional societies, primarily the arena for academics in Korea, have been offering increasing number of continuing education programs for industrial personnel.

However, the extent of such collaboration has been quite small. To cite an example, the academic division of the Korea Advanced Institute of Science & Technology(KAIST), the foremost research-oriented graduate school with over 150 faculty members and about 2,000 graduate students received a total of about 1.6 million U.S.$ as contracts(for a total of 36 projects) from industries in 1987. And to this the fact that the contribution to other universities except two or three institutions nationwide is paltry, and we have a pretty dismal picture of the cooperation as far as research activities are concerned.

When discussing scientific research in the context of its industrial application it is often useful to classify the entire activities into basic and applied research, breaking down the latter further into applied generic research and applied proprietary research. Basic research needs no further explanation except to say that it is done without any particular utility in mind. Applied proprietary research aims at utilizing the results of basic research in order to generate information that could be useful in developing technologies for a particular industrial firm. As such, it requires secrecy, and it is best done by in-house R&D personnel of the company concerned. If it is done by an outsicer, he is required to agree not to divulge the result of his work to those unrelated to the firm concerned.

The applied generic research is an area for fruitful collaboration between the academic and industrial researchers. This is also an arena into which government can fruitfully enter in order to channel the efforts of an entire industry along a desirable direction. The work is of such nature that the result could benefit a multiple of industrial firms without wasteful duplication of efforts by each of them separately.

In a recent publication by the Office of Technology Assessment of the U.S. Congress entitled "Commercial Biotechnology - An International Analysis" it is stated : "In fiscal year 1983, the Federal Government spent $511 million on basic biotechnology research compared to $6.4 million on generic applied research in biotechnology. The relatively low level of U.S. Government funding for generic applied research in biotechnology may cause a bottyleneck in this country's biotechnology commercialization efforts……. The Japanese

Government, in contrast, is devoting proportionately more public funding to the solution of generic applied problems than to basic research. The pattern of funding in Japan may reflect a policy of placing a greater priority on generic applied research in lieu of basic research because the Jppanese may rely on the United States and other countries to prove the early feasibility of new technologies for commercialization. This strategy worked well in the semiconductor industry, and Japan may very well attain a larger market share for biotechnology products than the United States because of its ability to rapidly apply results of basic research available from other countries." It is often stated, more like an old wives' tale, that in terms of the benefits reaped from basic research in the form of commercial technologies, there are three distinct classes of nations. In one extreme end of the spectrum, there are those that have expended outstanding efforts in basic research with proportionately nuch less fruits in industrial technologies, and in the other extreme, there are those that have expended relatively small efforts in basic research while reaping disproportionately large benefits in terms of industrial technologies. United Kingdom (and France, to some extent) is placed in the former, while Japan is placed in the latter category. U.S., with its enormous R&D resources, are placed somewhere in the middle. Fortunately, the interaction between the industries and the academia in Korea has been on the rise in recently years and there has been a number of encouraging new developments lately. The Korea Science & Engineering Foundation (KOSEF) initiated a new mode of research funding two years ago to support on a substantial scale those basic research areas identified jointly by industries and academia as being relevant to the development of new technologies. This program, called the "Mission-oriented Basic Research Program", brought together academics and industrial R&D managers to prepare a detailed list of research areas suitable for academic research that industries consider vital in their efforts to develop new technologies. Substantial portion of the list contains topics for applied generic research that require group efforts.

Very recently, the Korea Electric Power Company, in collaboration with the Ministry of Energy & Resources, agreed to support the power related research work of a consortium of university professors, and earmarked more than 10 million U.S. dollars over the next three years. Such initiatives on the part of industries are expected to increase substantially in the coming years.

KAIST has been operating a program whereby industrial R&D personnel are allowed to work toward M.S. and Ph.D. degrees jointly derected by KAIST professors and industrial supervisors. These candidates are often sent to KAIST with research problems relevant to the industries sponsoring their study and fund earmarked for the research, and the result is a built-in collaborative research work.

These programs, significant though they may be in demonstrating successful cases of industry-academia collaboration, are limited to a relatively few participating organizations and need to be broadened drastically in order to utilize the human resoruces available in universities throughout the nation.

4. A New Experiment in Academia-Industry Collaboration

The Pohang Iron & Steel Company (POSCO), established in 1968, is a symbol of Korea's determination to develop her economy. The steel mill is regarded as one of the world's most competitive one at present. The research and development activities begun in the late 70s, although adequate to provide the in-house technical service, was unable to carry out central research work for a forward-looking modern corporation. With a total production capacity expcted to reach a peak of 20 million tons per year by the middle of next decade, at which time POSCO will be one of the world's largest steel producers, the company was looking toward business diversification in anticipation of the inevitable decline in the steel-making activities of Korea in the early years of the coming century.

POSCO made a bold move to create a first-rate, research-oriented institution of higher learning in science & engineering, and integrate with it its own central research laboratory.

The idea, once formulated, moved rapidly in a typical POSCO fashion. The new institution, Pohang Institute of Science & Technology (POSTECH), took only 17 months from the time the Ministry of Education approved the establishment in July, 1985 until its inauguration on a new campus in December, 1986. The first freshmen class of 250 were drawn from the top 2% of the nation's pool of high school graduates, and a graduate school begun in March of this year drew more than 15 applicants for each admitted. POSCO's central research laboratory was made autonomous by the creation of the Research Institute of Industrial Science & Technology (RIST) in March, 1987. RIST, sharing the campus with POSTECH, absorbs the old technical service function along with its new mandate to serve as the research arm of the POSTECH as well as the corporate research laboratory of POSCO. Thus, the POSTECH-RIST-POSCO combination constitutes a community with a built-in Industry-Academia collaboration.

Let me give you an illustration of this collaboration. The department of chemical engineering has five major areas of concentration, one of which is catalysis research. The Catalysis Team now consists of 4 professors, 3 postdoctoral fellows, 4 full-time research assistants, and 4 graduate student and 3 high-level technicians. This is a substantial team, the largest team devoted to catalysis in the nation. On the other hand, POSCO steel works located in Kwangyang produce a surplus off-gases, by-products of steel mill operation, consisting of cabon monoxide, hydrogen, hydrocarbons, nitrogen, and other minor components. The amount of carbon monoxide alone is expected to exceed one million metric tons per year when POSCO completes its current expansion of manufacturing facilities during the mid-1990's. This happens to be a valuable raw material for producing many chemicals, and a concerted effort between POSTECH, RIST and POSCO is being directed toward finding commercially feasible processes.

POSCO hsa earmarked about one million U.S. dollars of research fund (including capital equipment) for FY 1988 in order to support the R&D efforts of the catalysis team, and the team is engaged in research activities ranging from basic to applied proprietary. The final goal is the development of a commercial process for manufacturing chemicals such as acetic acid, mixed alcohols, ethylene glycol, etc, from the carbon monoxide and

hydrogen gases contained in the off-gases, and the research team of POSTECH will handle the upstream end of the total project, leading up to the pilot plant design. It is expected that the staff of RIST will collaborate with the POSTECH team in the pilot plant operation. Design of full scale plant and its operation would probably be handled by a company to be set up at a later date, but POSTECH and RIST team is expected to take part in it.

In this illustration, the academic team will engage in basic as well as applied generic research, while the RIST task force will tackle the applied proprietary research. The specific need of the POSCO to find means of utilizing its by-products provides the necessary impetus and motivation to mobilize R&D resources, both human and physical, available on the same campus.

This example is only one instance of potentially very extensive collaboration between the three organizations encompassing such areas as opto-electronics, supercondictivity, computer-integrated manufacturing, biotechnology, pharmaceuticals, fine ceramics, to name a few.

The need exists and the ingredients for close collaboration are present in one place, an ideal arrangement, but whether the concerted efforts bear fruit depends very much on the organization and mode of operation of this cooperative venture

Let me outline the most important feature of the operation of this industry/academia collaboration. The function of the central research for POSCO is to be carried out by RIST staff as well as faculty members of POSTECH under a joint appointment with RIST. At present, there are nine Research Divisions each headed by a professor or a RIST researcher : Chemical Engineering, Chemistry, Physics, Mechatronics, Information Science, Fine Ceramics, Polymers, Metals, and Electronic Materials. Each division consists of a number of faculty members, full time RIST staff and graduate students. RIST is responsible for supplying research space, manintaining research equipment and providing all the logistic support needed for the effective operation of the laboratories. Coordinating the activities of these divisions as well as supervising the support functions are two RIST vice-presidents who hold joint appointment with POSTECH. The full time research staff are hired at the recommendation of the division director, and as such, each staff member is accountable to the director/professor.

The director of a division has the ultimate responsibility for defining the projects of his division and preparing the proposals for funding from POSCO. POSCO has two different modes of funding : contract projects and grant projects. Contract projects must meet the long-term as well as short-term needs of current plant operation, and the grant projects are mostly unrestricted as long as they can be justified in terms of the long-term diversification efforts of POSCO. A number of committees are being organized, consisting of representatives of POSCO, RIST and POSTECH as well as outside experts, in order to review individual proposals.

Auspicious beginning has been made : instructional buildings as well as laboratories are completed, and well equipped. More than 140 faculty members have been recruited, with more to join within the next few years. Ultimately, the 300 faculty members and 1,000 graduate students will engage in research in concert with several hundred full-time

research staff of RIST, many of whom will hold research professorship at POSTECH.

A number of obstacles need to be overcome in order for this experiment in industry-academia collaboration to become fruitful. First, and foremost, is the education of the middle management of POSCO as well as RIST regarding the true spirit and the necessity of this unprecedented endeavor and the importance of the creative management. The top management of the company took an enlightened and bold step in creating the framework, but the success of the experiment depends on those who must operate the novel system. They have no previous experience to guide them : it will be so easy for them to fall back on their experience in managing the manufacturing plants which is quite hierarchical, well-disciplined but inflexible, and not conducive to innovative thinking. We are already encountering mental rigidities and resistance to changes on the part of the middle echelon of the administration which could seriously reduce the effectiveness of the research workers if not corrected soon.

The relation between the professors of POSTECH and the full-time research staff of RIST could develop into an unfriendly, sometimes hostile one if a special care is not taken to remove potential sources of friction such as disparity in salaries, working conditions, and professional evaluation/reward system. Another likely source of difficulty is the possible lack of understanding on the part of some top managers about the nature of research activities, especially the fact that one should not expect immediate returns on research investment. Managers are judged in terms of the bottom line in the account sheet at the end of the year, and their tenure at the managerial position is not too long. How patiently will they wait for the results of the research activities to bear fruit for the company ?

5. Some Challenges in Wider Applications

The example given above is a unique case. A major industrial firm recognized the need for close collaboration with academia strongly enough to establish a new institution of higher learning, and placed the corporate research laboratory on its campus. The success of this experiment to promote researches, both basic and applied, of the POSTECH faculty, and fruition of this endeavor in the form of the development of new technologies, will be closely watched by industries, universities and the government.

Even though the ideal conditions of the above experiment cannot be duplicated elsewhere, it is nevertheless imperative that Korea's industries and academia come together on a scale much larger than currently being attempted because the human resources for R&D in the universities are simply too valuable an asset to waste. How to harness these resources for the development of technologies is a challenging problem.

A prerequisite for the industry-academia collaboration in R&D is a substantial investment in higher education by the government in order to free faculty time for research activities. The primary reason for the under-utilization of university professors' research potential is that their heavy teaching load does not leave them much time for research. A typical teaching load of 9 to 12 hours a week is two to three times the load of their counterparts in developed nations. A young faculty member subjected to such a heavy teaching load

wll quickly lose touch with research activities and in several years fall hopelessly behind his colleagues operating in more favorable research environment overseas.

The next requirement is a greatly expanded investment in capital equipment in all the universities. It is no exaggeration to say that there exists only a few exceptional departments throughout Korea that are equipped with what I would call a minimum necessary research facility. It is to be noted that I said *departments*, not colleges or universities. KAIST and POSTECH may be the only exception in that all of their departments are equipped "reasonably well".

These two requirements are necessry pre-conditions for promoting researches in science and engineering. I believe the time is ripe for both government and private sectors to step in to ensure that these minimum requirements are met. However, these are necessary, but not sufficient, conditions for fruitful collaboration between the academia and industries. Creation of an effective framework for the collaboration will require a considerable amount of ground work which takes into account a number of legitimate concerns on both sides. Some of these are enumerated below :

1) The excessive concern for secrecy on the part of industries, and the concern for academic freedom on the part of university professors.

2) The preference of many professors for independent work versus the need for group efforts in industrial research. In this connection, the lack of accumulated experience in collaborative research will impose some difficulties initially.

3) Need for enlightenment on the part of industry regarding the nature of research. There is a tendency to expect immediate returns on research investment which will lead to disillusionment on both sides unless the role of research is properly understood by the industry.

4) Balancing the basic and applied researches. It is all too easy for professors to choose basic research because the reward system in the academic world is heavily tilted in favor of basic research that can lead to publication in learned journals. Industry's need is much greater for applied generic as well as proprietary research which sometimes preclude publications.

In the face of the formidable array of difficulties, a beginning has been made, and a number of promising cases have emerged. A most promising framework that has been set up involves establishment of industrial technology research associations. A number of industrial firms with common objectives have joined in associations in order to support research and development efforts by university professors, research staff of national laboratories as well as industry's own research staff. The government, through the budgetary subsidies of two ministries, the Ministry of Science & Technology and the Ministry of Trade and Industry, share the cost of the R&D with the associations ; in addition, these associations are granted certain tax incentives. The arrangement is ideally suited for applied generic research. The results of the R&D work are made available to all members of the association, who can further develop them into proprietary technologies on their own. At present there are more than 480 companies organized into 35 associations, whose interest range from VTR to genetic engineering. That this is only a beginning is

indicated by the fact that the total research fund spent by all the associations in 1987 amounted to only 4 million U.S. dollars.

It is too early to tell how successful this effort will be in engaging a large portion of the research manpower of universities. If the pre-conditions for harnessing university research capabilities mentioned above are met, and if the university professors are organized into disciplinary consortia corresponding to the various research associations, then this could be a very effective framework for successful collaboration between industries and academia.

6. Closing Remarks

This is a narrative of an unfinished task. We have not accomplished much in the way of Industry-Academia collaboration for technology development. The experiments go on, and the outcome will determine the pace of our economic development in the midst of everincreasing technological competition among developed nations. I have described, in an easy narrative manner, an especially interesting example, and some of the intangible obstacles that lie ahead of effective collaboration between industries and academia, those same difficulties that will be faced sooner or later by many countries represented in this audience. In the endeavor for economic development through the promotion of science and technology we are fellow travellers, and we must learn from each other's successes as well as our failures, which are sometimes more important. I hope I have begun this process of learning from our collective experiences in this vital area.

Comments on Prof. Chung's and Prof. Kim's Papers

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Well, since I am a Korean, I would like to start with my apology as Professor Kyung-dong Kim of Seoul National University suggested. First for speaking in Konglish and secondly for not being involved in education even though somewhat involved in chemical education, not in education alpolicy. Anyway it is my great privilege to participate in this symposium and I am very grateful to the Organizing Committee for the invitation.

We have just listened to the excellent presentations from Professors Kun-mo Chung and Young-gul Kim. I think probably they are the best two people to discuss the cooperation of higher educational institutes, research institutes and industry in Korea because they have been very much involved in science policy making and also academic administration as ell as eaching and research. As the president Lee introduced, Professor Kun-mo Chung conceived of KA IS and probably the one most responsible for establishing KAIS and he was the first vice -president of the institute. And also Professor Young-gul Kim served as vice-president for academic affairs, director for planning and research as well as dean of the academic affairs and professor of chemical engineering. So all three of us were colleagues at KAIS at one time and I am very, happy to discuss their papers. However, I think it would have been much, better to have presentations not only from academia alone but also from the sectors of research institutes and industry. Nonetheless, I think presentations were excellent and I learned a lot. I am not in the position of criticizing the papers and I agree with their views and their problems rasied with more than hundred percent.

Professor Chung presented a simplistic view on the higher educational institution, industry, and research instutes and their cooperation from the higher educational institution side. He identified six outstanding issues as written : First, higher educational institution should be autonomous, I emphasize autonomous, and integrated organization of learning, researh and intellectual services. He emphasized curriculum change and research as their activity but as their major activity. The second one, he emphasized cooperation of higher educational institution, industry and research institutes. That is a must for the economic development of Korea. The third, he emphasized that highly trained manpower should be supplied by higher educational institution not only through formal degree programs but also via the non-degree programs like short courses, summer courses and evening classes, academia-industry cooperative program and so on. And fourth, he asked industrial assistance of higher educational institution donating eqipments setting up chair-professorships, fellowships, and giving out research grants. And fifth one, he emphasized that higher educational institution should broaden its educational scope and rearrange its priorities emphasizing cross-disciplinary and inter-disciplinary courses. And finally, he called for institutional innovations such as Engineering Research Center in the U.S. supported

by National Science Foundation and industry and bring the higher educational insitiutes from aloofness to relevance in the society and getting out of the ivory tower.

Professor Young-gul Kim started with research and development status review in Korea discussing manpower distribution and resources allocation showing that only three percent of Ph.D. people in Korea are working at industry but spending 68.5% of research resources, while at universities we have 83% of Ph. D.s but they spend only 5.5% of the research resources showing very serious imbalance. He talked about demand for R and D manpower and idle university R and D personnel utilization as shown because only 3% of the industry peopole spend 68.5% and R and D money while 83% spend only 5.5% and that is great loss for the economic development of Korea.

Then he gave an example, namely KAIS, Korea Advanced Institute of Science as a successful, somewhat successful I would say, higher educational institute. Well, this institute has a reasonable research fund, not sufficient research fund, at least minimally equipped for research and professors who teach only three hours a week. So, professors at this institute can carry out some research compared to most of the other universities in Korea. Then, he discussed very experimental but somewhat successful POSTECH/RIST/POSCO collaboration, so called built-in collaboration, because the system is built for cooperation almost automatically. Then he gave many problems, possible problems which we may face like understanding of management on the research characteristics, some salary disparity between professors and research or industry personnel, or working conditions and so on.

So by these two professors almost all the problems are raised and whatever I say from now on may be very much redundant.

Now, I think we agree on that we must have competent and well trained techincal scientific personnel for economic development which should be supplied by higher educational institution. And science and engineering curricula and teaching method should be revolutionized in Korea. In the old Confucian philosophy, I think in old days, especially in Confucian era, government officials were very much respected and engineers and scientists were very much looked down. That should be changed. And the method of teaching, traditional way of just rote memorization should be abolished. Instead we should do more research and carry out many experiments in science and engineering. And professors should be given respect by giving them enough financial support to do research, by donating equipments, research grants and so on. And they should have their own self-respect and self-esteem by performing successful research and teaching. Professors themselves should establish their own self-respect and self-esteem. Then researchers at research in-stitutes should be rewarded for their efforts. But again, they should perform and give out tangible research results to get rewards as well as respect. As Professor Kim pointed out, professors at our universities teach more than 10 hours a week and it is impossible to do any reasonably good research if you teach, let's say, I think more than six hours a week. And we should increase the number of professors drastically and I think if we we increase the number of basic research and some will perform generic applied research. I don't think all the professors will carry out applied research. As Professor Kim pointed out, I think most of the professors are inclined to do basic research than applied research.

But if we increase the number, there should be some professors who would like to do applied research.

Industry, I think, should support higher educational institution by donating equipments, chair-professorships, fellowships, research grants, and so on. In developed countries, those things are well accomplished. There are many chair-professorships, many fellowships, and so on. And also there are many bilateral contracts between university and industry people. For example, recently Squibb, the nineth biggest pharmaceutical company in the U.S., made a contract with the Oxford University, whith Pharmacology Department. They are going to support the Oxford University with 32 million US dollars in next 7 years for construction, research equipments, and research expenses. In return, they will have the right to patent any discoveries made from that economic support. At Caltech 4 companies (Du Pont, Eastman Kodak, 3M and Shell Oil company) formed a consortium to support research in chemistry, chemical engineering, and in related sciences. In return, they are going to have a leading edge on the research ideas from discoveries and innovations made form that support. These kinds of things should be developed in Korea. We have some successful cooperation between universities and industry, especially at KAIST. One professor developed nuclear magnetic resonance CT, so called NMR CT, and the other professor develoed a computer chip lead-frame, some professor developed glucan from biotechnology, and audiotex was invented in electronics by another professor, and so on. But this success is far less than desired. We should have many more programs like that. And there are also some interactions between higher educational institutes, research institutes, and also academic societies. For example, very recently 4 industries, 2 academic societies, and one university institute studied synthetic detergent effects on environmental pollution but that, I think, is the for the first time we have this kind of program. We have, particularly, far less interaction between higher educational institutes and research institutes. We have some in the way of so called mission oriented basic research administered by the Korea Science and Engineering Foundation. It's just starting but we have to expand it very quickly. I think one of the biggest reason for the lack of industry-university cooperation is perhaps the lack of well trained personnel in industry. In Korean industry, we don't have many Ph. D. people. I think Professor Kim has already shown that only 3% of all the Ph.D.s are working in industry. So, most of the industries, not all of them, do not know how to tackle the problems. They do not know how to apply the discoveries even though they are made. So I think from now on we should send lots of Ph.D. people to industry. I think, in chemistry we produce about 150 Ph.D.s a year in Korea including foreign trained Ph.D.s We have only about 70 universities and colleges which have chemistry department. So more than, I think, 60% of the new Ph.D.s should get jobs in industry. Then, applied research in industry will develop very fast and they will need cooperation from universities and research institutes.

The salary disparity is very severe in Korea. In a way it is reverse, I think, in Korea that assistant professors are maybe better off than young Ph.D.s in industry. Furthermore, university professors get all the privileges. They get respect, Confucian philosophy respect, they get freedom (autonomy), they get disciples trained, and probably equal, if not better, financial rewards. I think it is wrong. That's why most of Ph.D.s would like to go to

universities rather than to the industry. That should be balanced. I think college professors get very much satisfaction out of their accomplishments and respect they receive. That much should be compensated for the industry people.

Well, there are many problems but we cannot accomplish all of these just in one morning. We need lots of money and lots of time. But in Korea, we are headed into the right direction and we will accomplish these cooperations and economic developments leading Korea onto of developed countries in the near future.

I thank you for your kind attention.

C8

Role of Education in the Post-Industrial Society with Special Reference to Korean Case

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Our modern education system with all of its strengths and weaknesses, is a product of the gradual accumulation of knowledge over many centuries of human experience. Formal education was born of an increasingly structured civilization, and thus dates back to the earliest moments in the development of society.

Current opinon held by academic circles generally divides the development of society into three distinct stages, the first of which was land-based and depended on agriculture and the labor of beasts of burden for its sustenance. This earliest social structure was already a major advancement over the previous hunting and gathering life style of early Man.

The second stage in the development of human society was ushered in with the invention of the steam engine and, subsequently, of mass-production lines. with the birth of industrial society, manufacture and trade became the primary tools for the accumulation of wealth and the achievement of social status. The race to develop products which would sell in great quantities and bring the producer fame and prosperity led to feverish technological advancement. This, in turn, precipitated Man into a form of civilization for which he was scarcely prepared, a civilization that we now refer to as the "information society."

The transition between the industrial and information societies was so abrupt that we have yet to digest the full implications of this latest human social structure. In this computer age, the majority of the people who have undergone higher ducation, and many who have not, have at one time or another sat down at a computer terminal. Very few of us, however, have a clear idea of just what these machines are made of, how they work, or exactly what are the implications for our social structure of their enormous potential to reduce temporal and spatial distances to almost zero.

The information society has come into being through the rapid convergence of computer and communication technologies, and will greatly influence society both on the individual and institution levels. Potential benefits are many : human productivity is enhanced by the speed and accuracy of automation ; levels of education rise, as the demand for manual labor decreases and technical know-how is sought ; the potential for a far greater depth of intercultural understanding is born of the new possibility to communicate across vast distances with virtually no loss of time. It is certain that recent technological achievements will prove to offer more advantages to mankind than we can as yet imagine.

However, along with these advantages will come an entirely new set of social consequences and responsibilitieis both on the individual and institutional levels. Though not fully established empirically, it is apparent that the advent of telecommunications is replacing more private, personal and affective forms of communication, and that it often

results in alienation. Research shows that mass communication technology contributes to the decay of primary relationships and to the detachment of people from their community. It takes time away from personal interaction and exacerbates feelings of rootlessness and isolation. Mass communication, the most prevalent means of interaction in the information society, also tends to breed uniformity, regimenting individuals into standardized modes of thought and activity.

On an institutional level, far-reaching consequences for society are in the offing. Institutional order will under go significant readjustment, as the new instruments of communication are designed to bypass the existing channels of communications in which information passes through authority structures in the spheres of politics, religion, education, kinship and ecomomy. Various messages, therefore, now reach individuals directly, without intervention from the establishment.

For example, under the ubiquitous onslaught of mass media, traditional Confucian ethics, norms and values which had formed the backbone of the Korean cultural system are experiencing rapid erosion. Traditional norms emphasize hierarchical social relationships such as those between noble and commoner, husband and wife, parent and child, superior and subordinate. Democratic and egalitarian values are taking their place on a massive scale. Hierarchical and egalitarian social relationships stand opposed to each other, and the potential conflict between them looms large as Korea absorbs more and more influence from mass media.

What is generally considered a generation gap between the establishment and the youth of Korea is abetted and ever widened by the rapid dissemination of egalitarian principles. The establishment holds to an authoritarian and hierarchical normative framework, while the young argue for equal rights and access to democratic processes. The generational conflict becomes rather stark when we consider that approximately 75 % of the populace was born after 1945, and, therefore, were raised in an environment that was far less authoritarian than that of the pre-1945 period during which the majority of thoes in authority today came to maturity. Under this situation, potential conflict between the two are enormous.

While mass communication is the vehicle for new ideas to reach vast audiences and alter their perceptions and values, often turning them away from traditional structures of authority, it also places in the hands of existing institutions powerful tools to control unrest and to maintain their positions of authority. The tools consists of sophisticated instruments for gathering and storing information and the power to control access to this information. Thus, we see increasing data banks of information concerning every citizen of nearly every nation in the world as well as electronic surveillance devices, both of which, if left unchecked, will restrict personal liberties in the information society.

In addition, communication technology has brough about a whole new aspect to personal and collective competition, where in those with greater access to information dominate those with limited access. This phenomenon is present in all walks of life. students in one nation who have at their disposal vast pools of electronic data, micro-films, computer terminals and the like are at a distinct advantage over those who do not. The

same holds true in businsee, politics and even war.

Mesthene, in his explanation of the mechanism of social change, states that new technology, communication or otherwise, when introduced to a society has a three-stage impact on that society : first, it provides a new alternative to the existing mode of life ; second, it alters patterns of human communication ; finally, as a byproduct, it produces social problems. Therefore, the problems and points of impact previously mentioned should be anticipated and deserve serious consideration. To ignore the repercussion of unshared communication technology is to court social as well as political unrest.

Rapidly emerging capabilities related to the advent of computer aided communication technologies will inevitably challenge traditional methods, which, in turn, is likely to result in value conflicts and ethical problems. Advances in science and technology must remain consistent with the public good. But what is the role of scientists and engineers when such advances as that of the information revolution bring about difficult political, social and ethical question ? Conflicts between the professional and social resopnsibilities of scientists will continue to arise in the course of the emergence of the information society. Professionals must exercise self-regulation and self-discipline in order to moderate the negative impact of technologies such as the world has witnessed in the case of nuclear reaction.

In addition, those holding positions of authority as the new age emerges must spare no efforts to bring abour a gradual, steady transition that will allow the impact of new communication technology to be effectively absorbed, while dislposing of any obstacles as they arise. This task may prove highly frustrating, as technologies designed to drastically shorten distances in time and space do not allow for a comfortable margin fo gradual accommodation.

While we cannot effectively predict whether the side effects of the information society will be closer to a nightmare than a utopia, we must be prepared to cope with the revolutionary changes in the full gamut of life and guide society toward a workable change for the better.

Given the potentially explosive nature of the new information socicty, the former system of gradual adaptation to change and of scattered, dislocated educational structures are no longer workable. The advent of communication technology, and its accompanying dangers requires that educators around the globe somehow take advantage of the ability to move goods, knowledge, and even themselves from one continent to another in order to pool their considerable resources and experience and re-create the entire concept of education. True intercultural exchange, rather than the traditional "trickle down" of information and norms from wealthy societies to the less affluent, must be fostered. The technological advances of developed nations must, of course, continue to be transferred to underdeveloped nations ; however, understanding of and sensitivity to other cultures and social structures must be fostered among people of wealthy nations. Only then will we have a chance to avoid some of the more dire consequences of rampant technological advancement and of the uneven and disproportionate distribution of wealth in the world which may, if not checked, become seriously exacerbated as the post-industrial society

develops.

The rapid widening of the gap between the wealthy and the poor in post industrial society is brought about by the new economic order in which the introduction of a new idea can carry more economic value than the force and measn of production in industrial society. Under this new economic order, a youth without the existence and capital that would have been necessary for an ascension into the ranks of the truly rich in industrial society now has the means, in the form of his or her intelligence, to amass startling amounts of wealth within a very short period of time. The 26-year-old inventor of the Apple computer who become a billionaire within a few short years is a case in point and serve to illustrate the growing importance of education in the information society.

Clearly, the information society will have a tremendous impact on education. With the increasingly widespread availability of computers, a major, large-scale breakthrough in education, similar to that experienced soon after the develpment of the printing press, is imminent. According to John Slaughter, "Most of the subjects traditionally taught at schools could be available in the future on computers, and in a form that would make them highly adaptive to each student's individual interest, abilities and needs." thus, if individualized instruction is made possible for all students, the entire concept of education will change accordingly, resulting in a breaking down of institutional barriers and allowing mass participation in higher education.

It is significant to note, however, that the 26-year-old billionaire was an American. It would seem that post-industrial society does not offer a change in the trend of economic advantage for Western industrial nations that has prevailed since the advent of the industrial revolution. While a certain head start into the post-industrial society is to be expected for the more advanced nation, it would be unfortunate if underdeveloped and developing nations failed to realize that an information-oriented economy offers an unprecedented opportunity for them to "catch up." Success for developing nations in industrial society, most notably Asia, was hampered by limited natural resources and by overpopulation. In the information society, however, abundant human resources steeped in a Confucianist tradition which values education so highly could bode well for Asia as human intelligence and new ideas take on greater importance.

For Asia to prosper, then, in post-industrial society, her peole must redefine and restructure traditional education system. Although Asian youngsters are just as likely to attend college as Westerners, our 4 years of undergraduate education, representing a mere 97 full days in the classroom, are insufficient training in the face of our dire need for a vast and growing pool of creative ideas to be used for social and economic development. The classroom experience must be intensified, both quantitatively and qualitatively, in order to increase the knowledge, that is to say, the accumulated information, of each and everyone of our students. If Asia can tap its immense human resources in this way, it may become the center of civilization once again.

One of the existing vehicles to bring about an effective, globally based education system is the organization of international academic exchange programs. These programs have traditionally served to promote intercultural understanding and have the potential

to be restructured and improved in such a way as to provide a forum for the complete renovation of academia. We in Korea have benefited from student and faculty exchanges over the years. Until recently, these exchanges were mostly geared toward providing our professors and students an opportunity to gain information from more advanced nations. This trend is changing, however, We are seeing more Third World students come to us for information and we are seeing students from developed nations come to enhance their knowledge of Asian culture. The quest of American and European scholars for information concerninng other societies is a favorable sign showing that they and we are beginning to grasp the implications of living in the informatiion society.

The next step is for governments to support and encourage international exchange, with professors in every field of academia sent from and to every nation on Earth. These professors will, in turn, provide guidance for positive student exchange and will lay the foundations for an education system which conforms to the requirements of our rapidly developing information society. Ideally, this new system would affect every level of education, from primary school through post-graduate study, and would instill in our young people a tolerance of foreign cultures and skills that would make them capable of intercultural communication. It would also endeavor to construct for our young people a new code of ethics which holds respect for the lives and happiness of others as its guiding theme. If we are to create and apply such a system on a global basis, international exchange programs are a necessary first step.

But this first step must not be a blind one of simply increasing cross-cultural contact. Too often such a numerical increase in contacts breeds conflict rather than cooperation. This conflict can be divisive and, ultimately, can undermine the educational objectives of the program. International education must address the barriers to mutual understanding and cooperation.

If our disorganized, competitive approach to education is allowed to persist, if academic protectionism and the one-way flow of information from advanced to developing societies continues, we will be faced with as yet unthinkable consequences. On the other hand, if we nurture the growing cooperation between universities around the world and put to work the ultimate potential of academic exchange, we may be able to create and international forum for the guidance of the information society.

In short, we can provide education through exchange of educational resources and manpower to enable our young people to adjust to the shifting physical and social envirnment of our increasingly interdependent world. We can promote the sharing of knowledge and collaborate on research through faculty exchange. We can keep vigilance over the advancement of technology and its considerable social impact. And we can become the master of the power of silicon chips, rather than being reduced to the status of plight of slaves in the information society.

The International Development Program of Australian Universities and Colleges(IDP) : Past, Present and Future

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The theme of this '88 PRAHE Seoul Conference-Higher Education and the Asia-Pacific Century - is one which has been a particular concern of IDP's for many years. I am indeed honoured to have been invited by the organising committee to deliver a lecture on this theme ; it is a task which I undertake with much pleasure and enthusiasm as it gives me the opportunity to present an Australian perspective to this most distinguished international audience. It enables me, too, to raise some current issues which are being actively debated in Australian universities and colleges and to share our experiences with you. Such exchanges are invaluable as they help us to see these issues in the international perspective, thereby creating a more effective and objective environment for our own decision making.

I have been invited to take the "case study" approach ; and I propose to track the development of my own organisation from its small beginnings in 1969 to its present day structure and function, a history spanning fewer than twenty years of this century. This account will lead me to a brief review of some of the very significant changes during the last two years in Australia's policies on overseas students. Finally, I shall draw on very recent developments in cooperation between Australia and Korea in higher education.

On 30 November 1969 the Australian-Asian Universities Cooperation Scheme(AAUCS) was established by an exchange of letters between the Australian Vice-Chancellors' Committee (AVCC) and the Department of Foreign (then External) Affairs. Once governments of the receiving countries had agreed to such a program, the scheme was to be an undertaking between universities, assisted by governments. Initially, the main emphasis of the scheme was to be on the scientific, technical and socio-economic aspects of food production.

There were three steps in the AAUCS program ;

- first, the establishment of a standing committee of the AVCC to develop and administer the scheme ; the standing committee was supported by a part time Academic Director and an Executive Officer with the AVCC secretariat ;
- second, the convening of a seminar between some Australian universities and interested persons and groups to discuss its implementation ; and
- third, missions to Indonesia, Malaysia and Singapore, the initial countries to be involved. The first mission, in November/December 1969, made recommendations for a program in the ensuing year, and a second in June 1970 made short and long-term proposals for the development of a program in Indonesia ; the first program was conducted with a budget from the Federal Govermment of A$ 100,000 in 1969/70 and A$ 200,000 in 1970/71.

AAUCS felt that Indonesia had the strongest claim and that the program should concentrate on upgrading university staff in faculties and departments concerned with food production in the broadest sense. In the first year basic equipment－glassware, reagents and instruments－and Australian technical journals in the agriculture and veterinary fields, were supplied to eight universities in Indonesia ; and senior staff from Australian and Indonesian universities exchanged visits. In the second year, the first short course, of one month's duration, on tropical pastures and their utilisation by animals, was run at Universitas Udayana, Denpasar, Bali. The course was given by three Australian lecturers and one demonstrator to 15 Indonesian university staff.

The initial emphasis in Indonesia was on short training courses and follow－up research, the development of supporting technical services and the provision of basic equipment and library material. Fellowships were established to enable Indonesians to undertake higher degrees and short－term postgraduate training in Australia, and for Australians to work in Indonesia.

During this period, limited assistance was given to Malaysia and Singapore while the prospect for further cooperative development assistance to their universities was being examined.

During the first decade, AAUCS activities were limited to the three countries mentioned. At the request of the recipient countries, activities were restricted to certain of their universities, and on the Australian side the level of activity was constrained by the money provided. In 1971－72 the content of the program began to expand along lines in the 1969 plan. The first steps were taken to extend activities to population studies, forestry, food technology, agricultural development, economics and English. There was steady but significant growth in the levels of appropriations during the first ten years of operation of the scheme.

Funding was appropriated annually by the Australian Development Assistance Bureau (ADAB) ; the cooperation countries provided financial support, e.g. research funding and some staffing ; Australian universities and other participating organisations provided many services without charge to the scheme, especially staffing for short－term assignments.

Initially the three countries and the collaborating universities were ;

- Indonesia ; Universitas Hasanuddin (UNHAS) at Ujung Pandang, Sulawesi
  Universitas Udayana (UNUD) at Denpasar, Bali
  Universitas Brawijaya (UNIBRAW) at Malang, East Java

  These three are known collectively by the acronym of the HUB Universities, and this is where most of the AAUCS activities were initially undertaken.

  In addition specific programs have been conducted at ;
  Institut Pertanian Bogor (IPB)

Universitas Gadjah Mada (UGM)
Universitas Indonesia (UI)

Malaysia : Universiti Pertanian Malaysia (UPM) at Serdang, Selangor

Singapore : Nanyang University, (now Nanyang Institute of Technology)and the University of Singapore

Salaries of university staff engaged on projects were borne by the individual Australian universities, except where staff were seconded for extended periods (more than three months), when replacement costs were met by the scheme. Thus, academic services were rendered at minimum cost.

Because AAUCS was an undertaking of the Australian universities conducted through a standing committee of the AVCC, participating personnel could be drawn from any Australian university and, by special arrangement, from colleges of advanced education and government departments and the private sector. Each Australian university nominated Academic Laison Officer (usally a senior academic who had undertaken an assignment)and an Administrative Liaison Officer(from the Registrar's office).

Thus the prime focus of AAUCS activities was the upgrading of staff in participating universities overseas. In Indonesia, assistance comprised training courses, visiting assignments and the secondment of Australian staff in a number of disciplines. In Malaysia and Singapore, the emphasis was on faculty development. In all three countries, direct Australian participation in development was supported by a comprehensive postgraduate fellowship program.

Academic guidance was provided by senior Australian academics who were appointed as honorary AAUCS Consultants in each of the major disciplinary areas ; the consultants were responsible to the academic Director for the implementation of the program.

A key element of AAUCS activity was the fellowship program designed to assist Asian academics to undertake special studies, postgraduate diploma courses or higher degrees in Australia. They varied from two or three months to three years or more and, under certain conditions, also for field work for a degree course to be done in a Fellow's home country.

Nominations were made in accordance with the practice and procedures of the home country and the Australian official training program, often after discussion between the Australian consultant and his Asian counterpart. The final selection rested with the Academic Director and appropriate Consultant. Terms and conditions were the same as for Colombo Plan Fellowships.

AAUCS also provided modest financial assistance to Australian academics travelling overseas—who did not need be involved in AAUCS programs—to break their journey in Indonesia, Singapore or Malaysia in order to visit places where there was an AAUCS program. Such visits were arranged through the Consultant, who sought the consent of the Asian

University and the Academic Director. These visits ranged from two days to two weeks and the visitor usually discussed courses and/or research programs. A report on the visit was submitted to the Academic Director through the Consultant.

Each Consultant furnished to the AAUCS Library Consultant a list of books and journals in his field required at the Asian university. Following regular visits to the libraries the Consultant would make recommendations on how the library services may be upgraded ; from time to time trained librarians were brought to Australia on fellowships for further training and to gain experience in Australian university libraries.

AAUCS instituted a program of Teaching English as a Foreign Language (TEFL) in Indonesia, with the supply of texts and teaching aids and with fellowships for training at the University of Sydney.

The pattern of many development assistance projects, other than AAUCS, is for a team of experts to visit the recipient country, carry out the designated task (which often includes a training component) and then withdraw. In the absence of any formal follow-up, the momentum gained as a result of the team's efforts often decreases steadily and the aid experts are understandably disappointed with the eventual net level of development.

A feature of AAUCS programs has been a conscious effort to establish and maintain links between the Australian and the overseas universities so that lasting benefit is achieved. The functions of AAUCS, as set out above, all focus on this feature.

During the first decade an intricate network of relationships was developed between the Australian universities acting collectively and nine Asian universities in three countries.

I have described these early activities of AAUCS in some detail to highlight four key features of the scheme which were essential to its success ;

- it had government support and endorsement ;
- it operated within a government to government and system to system framework ; but
- it provided for direct university to university and people to people linkages ; and
- it depended on financial and other commitments from both sides of the partnership.

By the beginning of the 1980's the Australian government's financial support had risen to over $1 million and project activities were expanded to encompass Thailand and the Philippines. Discipline areas covered by projects had also increased to embrace the new fields of coastal and harbour engineering, chemistry, communications, accountancy, business management and meteorology. Aside from Commonwealth support, AAUCS activities received contributions in kind from Australian and Asian institutions, mainly in the form of research funding and staff support, particularly for short-term training needs.

The year 1981 saw a reorganisation and expansion. AAUCS changed its name to the

Australian Universities International Development Program (AUIDP), a change which reflected the broader base and objectives of the program from its relatively small start in 1969. By 1984 the ADAB appropriation for the AUIDP Core Program (that is, the traditional AAUCS activities) had increased to $4.5 million and further changes, with the formal participation of the college sector in AUIDP activity, were in the wind.

By 1983 the advanced education sector was contributing in a significant way to the work of AUIDP and was actively seeking a greater involvement. The AVCC and its equivalent in the advanced education sector, the Australian Committee of Directors and Principals in Advanced Education (ACDP) set up a joint working party under the AVCC Chairman (professor Michael Birt) to examine the future structure of AUIDP. With commendable expedition the working party recommended to AVCC and ACDP that a new organisation be formed as a company limited by guarantee in the ACT with objectives similar to AUIDP but with a Board of Management comprising five Vice-Chancellors, three Directors or Principals, one person associated with the TAFE sector, two nominees of the Minister for Foreign Affairs and the Executive Director. Thus in November 1984 the International Development Program of Australian Universities and Colleges (IDP) was born.

Throughout this period of growth and expansion of its activities, geographically, by discipline and in the number of participating institutions both in Australia and overseas, the prime focus of IDP and its predecessors has remained unchanged ; institution building through staff development. This central theme has been kept to the fore during the very significant changes which have flowed from the recent Australian policy initiatives in respect of overseas students and the marketing of education services overseas. Indeed, these policy decisions were taken within the twelve months following IDP's establishment and as I have indicated, they were to have far reaching effects on the Australian higher education sector generally and on IDP activities in particular.

These policy decisions stemmed from several high level studies ; in 1983 and 1984 the Committee to Review the Australian Overseas Aid Program (the Jackson Committee), the Committee of Review of Private Overseas Student Policy (the Goldring Committee) and the Joint Parliamentary Committee on Foreign Affairs and Defence each examined and reported on the complex aid, trade, foreign affairs, developmental and educational considerations involved in providing educational services to overseas countries. The recommendations and perspectives of each differed quite markedly and the Australian government, in grappling with the problem of trying to formulate effective policies from the disparate and often conflicting recommendations of these reports, was confronted with competing pressures and priorities.

After a long' period of deliberation by the Federal government on the recommendations of the Jackson and Goldring Reports, the then Federal Minister for Education, Senator Susan Ryan, announced, on 22 March 1985, the "new Policy on Overseas Students". In essence this policy provided for a continuation of the existing arrangements for sponsored students and for private subsidised students (although the overseas students charge, formerly called the visa fee, for the latter would be increased) and a new initiative whereby students not

accommodated within the quota of subsidised students could be admitted provided they paid the full cost of the courses.

Prior to 1986 Australia provided places in universities and colleges for overseas students on a fully subsidised basis through the Australian Development Assistance Bureau (ADAB), and on a partially subsidised basis through a quota program. Overseas students admitted under the quota program are generally referred to as subsidised overseas students as they are required to meet part of the cost of their education by payment of the Overseas Student Charge (OSC).

In July 1985 two missions, sponsored jointly by the Departments of Trade and Education, visited countries in Southeast Asia to gauge the level of interest in full-fee courses offered by Australian institutions. Notwithstanding the haste with which the missions had been mounted and the superficial nature of their enquiries, the missions concluded that there was a signifcant market for award and non-award undergraduate courses by private overseas students who would be prepared to pay full fees. A marketing strategy was developed by Department of Trade officials in consultation with the department of Education and this resulted in a policy statement on the Export of Education Services, which was released on 23 September 1985.

Thus in addition to the modification of the private (i. e. subsidised) overseas student program , a new commercially oriented policy of exporting education services at full cost applied from 1986, reflecting the Commonwealth's concern to boost Australia's overall export performance and to arrest perceived problems with its balance of payments and general trade position. Based on the underlying assumption that Australia enjoys a significant "comparative advantage" in education services by virtue of its strong domestic system, geographical location and close links with the Asian region, the main features of the new policy were ;

- Individual institutions would be free to offer an unlimited number of places to overseas students either here or overseas for a full cost-recovery fee.
- The full fee would be determined on the basis of the full average recurrent cost of the course provided, with a further proportionate cost attributed for the use of capital and equipment resources by overseas students. The Commonwealth Tertiary Education Commission (CTEC) would have responsibility for approving the proposed fee structure established by each institution for particular marketed courses.

These new arrangements effectively meant that Australia would have a "deal-track" policy for admitting overseas students-on the one hand a refined aid-based program based on ADAB-funded scholarships and the subsidised private student quotas, and, on the other hand, a commercially oriented export sector based on an unlimited number of overseas students determined only by their capacity to pay.

I now turn to the trade and aid considerations involved in pursuing overseas education initiatives and in doing so say a little more about the Jackson and Goldring reports I

mentioned earlier and about the role of IDP.

The recent reconsideration of policy for overseas students was prompted by many considerations including ;

- criticism of the cost of providing extensive aid-based education ;
- concern that Australians were being disadvantaged by the presence of large numbers of overseas students in our institutions ; and
- a fear that some overseas people were using the quota program as a back-door method of immigration.

Many of these concerns have, I think, been ill-founded and distorted by the extensive public debate, particularly those related to immigration and opportunities for Australians.

However, the issue of cost and the changed pattern of economic relations between Australia and its near neighbours in Asia in recent times have undoubtedly emerged as major influences on government policy.

The economic growth rates and trade performance of the ASEAN economies have been quite dramatic in the last decade. During that time GNP in the ASEAN block grew at an annual rate of almost 10% and its share of world trade increased sharply. Thailand and Singapore, for example, increased their exports of merchandisable commodities by an annual average 12% in contrast to an annual export growth of only 5.4% in the industrialised world. This increased economic clout has been further enhanced by a closely knit and coordinated ASEAN approach to multilateral trade negotiations at an international level.

The Australian Government has quite rightly been concerned to respond to these developments. Although Australia's absolute level of exports to the ASEAN block has increased in the past decade, the dynamic growth rate of ASEAN has been such that our relative share of exports has fallen.

The Government has responded to this situation on three fronts ;

- revamping its own bureaucracy in the trade area by establishing an Australian Trade Commission (AUSTRADE) to identify export markets and coordinate trade policies ;
- implementing industry policies to restructure the domestic manufacturing sector ;
- seeking to establish new export industries in services, with education being the first and most important.

The Jackson Report, although primarily concerned with the totality of Australia's aid program, addressed the issue of providing education overseas from this standpoint and recommended a substantial deregulation of exisitng arrangements. Its principal recommendations were ;

- abandonment of all quotas for overseas students and the establishment of an unfettered market for overseas student places regulated only by supply and

demand and capacity to pay as an export earner ;

- fees to be determined by individual institutions and by what the market would bear ;
- the provision, separate from these arrangements, of a scholarship scheme for overseas students funded as part of the aid budget, without reference to meanstesting.

The Government's response was to embrace these recommendations in part by establishing an export sector in education services while at the same time maintaining the quota pro-gram for overseas students.

The aid perspective starts from rather different premise, believing that Australia has an obligation to provide direct aid and assistance to emerging nations to assist their economic and social development.

The primary considerations of the aid perspectives are ;

- Australia is technically committed to the OECD target of development assistance equivalent of 0.70% of GNP, but has found it very difficult to get even close to this target. In 1985 it was 0.43% and it has now fallen to less then 0.4%. Education programs could be a valuable and expanded component in a more generous official aid policy.
- Market-based systems of service delivery to developing countries will only be available to overseas students with substantial means and would only educate an elite. Moreover, scholarship systems are inefficient instruments for promoting equity, unless based on strict principles of need.
- A radical shift to a trade-oriented policy could generate hostility amongst our near neighbours with long-term detrimental consequences to our diplomatic and commerical relations.
- Existing aid-based programs have given Australia a strong reputation in Asia.

The Goldring Report emerged as the principal champion of this view, reflecting a body of aid and educational opinion built up over the forty years since the Second World War. Its main recommendations included ;

- recognition that overseas students under the quota program should meet some of the cost of then education through a gradual increase in the Overseas Student Charge ;
- maintenance of an overall ceiling on overseas student numbers but with the abolition of individual country quotas and a more even distribution of overseas students across institutions and faculties.

The Government partially embraced these recommendations by announcing the changes I referred to earlier.

The Government's compromise policy, embracing both the marketing strategy and maintenance of the quota program, has been criticised by proponents of both the aid and

trade perspectives as being unworkable. This is an extreme view but there certainly have been difficulties. For instance, under the new arrangements the basis on which fees are to be calculated for marketed and quota based courses are different. The unregulated component (the market) will charge fees based on the actual cost of the course provided, while the regulated component (the quota) has a fee (the OSC) which in 1988 will be 55% of the notional full cost.

In an address he gave on this matter in December 1985 the Executive Director of IDP said ;

> "In some instances anomalies could be created where a full cost course is set at about the same fee level as an allegedly 'subsidised' quota course. This may not only cause confusion but could also lead to unhealthy internal competition between the quota program and full-fee program leaving both aid and trade objectives unfulfilled. Furthermore full fee courses assessed in terms of the Commonwealth guidelines may not be competitive with those offered by the US, Britain, Japan and Europe.
>
> The full fee marketing strategy, while regulated in terms of fee level, will largely be based on individual institutions negotiating their own contracts and competing with each other for students. While in many instances this deregulated approach may increase efficiency, care will be needed to ensure that standards are maintained and our reputation in Southeast Asia is not sullied by an over-eagerness to sell our product.
>
> In some cases the individual institution approach may be counterproductive, particularly when tendering for Govemment or World Bank/Asian Development Bank projects, where central agency-to-agency or government-to-government contact is desirable. finally, it should be noted that the balanced distribution of the gains or earnings from marketed courses cannot always be guaranteed from an individual deregulated approach. It would be unfortunate if only a small handful of institutions benefited from the additinal money which marketing may bring to higher education."

It now appears clear that the Government is moving to remove these anomalies through the effective abolition of the subsidised program. But there is a more important lesson to be learnt to which I shall return later.

But first a comment on the role that IDP now plays in this new market-oriented environment.

In the new environment and remembering that IDP is a creature of the Australian universities and colleges and that the interests and objectives of these organisations have evolved and changed since IDP was established, it is to be expected that IDP's mission will also have evolved. It is now described thus ;

(i) to provide assistance to or take such measures as will increase the effectivenesss

of tertiary educational institutions and educational systems overseas, particularly in developing countries ;

(ii) to promote the use of the resources of Australian educational institutions, particularly at the tertiary level, by overseas governments and institutions to support educational development overseas ;

(iii) to facilitate increased enrolments of full fee paying overseas students in Australian educational institutions where this is consistent with objectives defined in (i) and (ii) above.

IDP's activities now cover four broad areas ;

- Overseas institutional strengthening activities of the Core Program involving fellowships and consultancy services, utilising Australian Government funding provided through AIDAB as a single-line appropriation in the aid budget ; this is the longest standing IDP activity. The level of Core Program activities is dependent entirely on the AIDAB appropriation ; requests from overseas for IDP assistance exceed by a substantial margin the services which can be provided within the current level of funding.
- Fellowhip operations, including special training packages, funded as an element of the sponsored Student Program or by overseas governments, often utilising funds provided by multilateral funding agencies such as the World Bank. The area of fellowship administration involves close cooperation with Australian institutions and overseas organisations.
- Technical assistance services usually involving competitive bidding for projects and staff training activities proposed by overseas governments and often funded by multilateral funding agencies.
- Educational representation through existing IDP offices overseas and at forums and exhibitions overseas. This involves the provision to overseas audiences of information and advice about Australian post-secondary education, the aim being to make courses, awards, standards, policies, procedures and costs better known and recognised overseas.

There has been substantial growth in IDP activities in recent years ; fellowship operations, particularly those funded by the Asian Development Bank, World Bank and national government sources, have expanded significantly ; IDP has undertaken a range of technical assistance projects ; and IDP has represented an increasing number of Australian tertiary institutions at overseas exhibitions. A measure of the level of the activity of IDP and its predecessors over the years and of the changing emphasis in the current climate is given in the following analysis ;

These figures reflect the success IDP has had in negotiating agreements with overseas government agencies for fellowships and technical assistance programs involving Australian universities and colleges.

I would like to conclude my presentation with an even more specific case study that of cooperation between the higher education systems of Australia and Korea. This specific

Year	AIDAB Appropriation ($ million)	Contract income ($ million)	No. of fellowships	IDP Staff	
				Canberra	Overseas
1969/70	.107	–	–	2	–
1974/75	.334	–	38	2	–
1979/80	.955	–	58	3	–
1984/85	7.200	.081	158	22	6
1985/86	7.200	1.091	201	29	7
1986/87	6.200	5.012	264	32	9
1987/88	7.200	10.000	460	36	17

case study is interesting because it is at a very early stage of development. Following a visit I made to Seoul in September 1987, an informal exchange of letters between myself and a counterpart in the Korean Council for University Education (KCUE) set the basis for a partnership between these two bodies.

Following an informal introductory seminar in Seoul in April 1988, a further bilateral seminar was held in Canberra on 23 June 1988. The seminar was an extremely useful opportunity for the enhancement of educational exchanges between the higher educational systems and institutions of Australia and Korea. The framework for these exchanges was set by the analytical presentations of the two systems and of their development over the last two or three decades by Dr. Chong-jae Lee of KCUE and Professor M. I. Logan, Vice-Chancellor of Monash University. There were remarkable similarities and some striking differences between the two systems.

Both systems are in a state of flux. The two govemments are seeking far-reaching changes in higher education policy. In Australia, the thrust of these changes has been indicated by the Green Paper ; in Korea, as Dr. Chong-jae Lee pointed out in his paper, a new policy direction, "Autonomy of University Education," was foreshadowed this year.

Both systems comprise institutions of various types, although the Koreans have not followed Australia in moving to do away with a binary system. There was a common articulation of the need for institutions to develop unique and distinctive specialisations with less concern over their name or formal status. The example of the Juilliard School of Music was quoted by Dr. Lee, as an istitution with an international reputation but which had neither the "rank" nor title of a university or college. The strength of this observation was reinforced by Professor Logan's expectation that the effective abolition of the binary system in Australia would lead to the emergence of centres of excellence in higher education and research spread across the university and college system.

A major distinction between the two systems is the high proportion of private institutions in Korea. Whereas, in Australia, we have one private university in the process of establishment and a few recognised private (religious) tertiary colleges, some four fifths of Korean colleges and universities are privately controlled (many by religious foundations) – 80 out of 102.

The title of the 1988 reform highlights perhaps the most significant distinction between the two systems. In Korea, the educational system in general, and higher education in particular, has long been subject to direct government control and intervention. The new reforms seek to enhance autonomy of universities in Korea. On the other hand, in Australia the federal government is seeking to play a more active role in Australian higher education, particularly through its control of funding and identification of priorities, but there is no likelihood that the federal government would seek to interfere with traditional areas of university autonomy of standards, course content and staff appointments.

The scope for exchanges was set within the context of the development of the Pacific Rim-in what Dr Won Sul Lee, President of Han Nam University, described in his paper as the "Emergent Pacific Rim age". The Pacific is neither a Soviet nor an American lake but a region whose countries have made enormous economic strides. Dr Lee described what he called the astonishing economic growth of countries such as Japan, China, and Korea. Dr Lee also pointed to the remarkable growth in the volume of trade between Australia and Korea ; the trade balance is significantly in Australia's favour, but the rate of growth in Korean exports to Australia has been very rapid. The growth in Australia/Korea trade is a specific example of the growth in intra-regional trade which characterises the Pacific Rim region.

Another element of this international backdrop is the perception each of us have of the others' countries. The seminars and the visit by the KCUE delegation to Australia has already done much to improve and sharpen these perspectives, but participants recogaize the need for a better understanding of each others' systems-so that Australia is no longer seen as a footnote in a scholarly book (you know where it is but you don't bother to look it up) and Korea is not just a country of student riots and tear gas-it is a distinctively different, unique country in the Pacific region.

There has also been a recognition of the need for a multiple level approach in further developing higher education links ; this echoes the key features described earlier as characterising the AAUCS or IDP approach to cooperation in higher education.

Firstly, some form of government to government agreement may be essential. A cultural agreement was signed between the Australian and Korean Governments some years ago but appears to have lain relatively dormant. The agreement does, however, provide for the encouragement of educational institutions in each country to teach the literature and culture of theory as well as for the exchange of scientific knowledge, the exchanges of scholars, student and research workers.

Secondly, the importance of holistic, system to system linkages was emphasised ; the formation of a broad framework that will allow for exchanges on matters which lie at the *core* rather than the periphery of the interests of institutions in both countries.

Thirdly, the consensus emerged that umbrellas such as the one now formed between IDP and KCUE are *essential* service arrangements to support and make more cost-effective bilateral institutional, faculty or personal linkages. The umbrella arrangements must, however, encourage rather than inhibit institution to institution and people to poeple links. At the very least, umbrella arrangements should ensure a sharing of information and, where appropriate, resources. A specific example of where an initiative set up by two institutions could be broadened to bring in other partners from each side was provided by the cooperative link between the Western Australian College of Advanced Education (WACAE) and Chung Ang University (described later).

Fourthly, and as a *general* principle, programs to be successful should reflect a commitment on the part of both sides and this commitment should be reflected in financial contributions.

Korean Studies in Australia

Part of the conceptual framework was spelled out by Professor McCormack of the University of Adelaide when he outlined a set of reasons for Australia to learn more about Korea. He, for example, described Australia's interests in a multipolar Asia not dominated by Japan.

Korean studies in Australia were an important means of enhancing Australia's knowledge and understanding of Korea. In this regard, the seminar provided the opportunity for a review of Korean studies in Australia.

It was noted that the number of scholars working solely in the field of Korean studies in Australia is small. However, there are some promising developments. A full undergraduate program in Korean language has been introduced at the Australian National University (ANU), and Swinburne Institute of Technology and Victoria College, Toorak Campus, have just received state government funding to establish courses in Korean language with emphasis on business studies and marketing/interpreting respectively. Elsewhere, proposals to introduce Korean studies programs are under consideration at various institutions, most notably the University of Adelaide. A further noteworthy development is the recent establishment of a Northeast Asian Studies program at ANU. The proposed key centre for Asian studies at the University of Queensland/Griffith University will also encompass Korean studies.

Academic Exchanges

A variety of approaches to academic exchanges was explored. There was overall endorsement of the value of such exchanges both of students and staff ;

- the models of a link between Korean studies in Australia and Australian Studies in Korea—under this Korean scholars would come to Australia to participate in Korean studies programs in Australian institutions, and Korean scholars would come to Australia to prepare Australian studies material for use in Australian studies programs in Korean institutions. The value of the prior existence of established programs in the respective fields was highlighted ;
- another model would be the sending of undergraduate Australian students specialising in Korean to Korea to extend their abilities in the Korean language and their knowledge of Korean culture and society. The English language abilities of undergraduate Korean students was improving ;
- the involvement of bodies such as the Korean Science and Engineers Foundation to support exchange/research programs could be explored ;
- have to involve serious programs with advanced planning of activities in the light of the abilities and interests of both sides. Need to explore relative strengths and weaknesses of each side ;
- further lack of information about exchanges and sources of support ;
- the idea of exchanges that go beyond higher educational institutions to include, employees of private companies who could benefit from a period in an Australian higher education institution.

Australian Studies in Korea

The seminar included a very useful session on Australian studies. A case study—the establishment of a Research Institute of Australian Studies at Chung Ang University through a cooperative arrangement with Western Australian College of Advanced Education (WACAE)—was described. It involved Australian and Korean co-directors, the appointment of staff at both institutions and the provision by WACAE of a collection of materials and by Chung Ang of accommodation support. Dr Lawrence suggested that there could be scope for broadening the role of the Chung Ang institute using it as a base so that the Australian staff could have an interaction across a broader range of Korean institutions.

It was also pointed out that there was a growing interest in area studies in Korea. A number of Korean institutions have, or are establishing, graduate schools in international studies (at least one of which—at Yonsei—was conducted in English). There could be interest in area studies on Australia. A step-wise approach leading eventually to full programs might be adopted.

A general theme emerged in this discussion as well as elsewhere—that it is in the mutual interests of both sides to understand each others' systems better.

Korean Students in Australia

Finally, there was a discussion of the particular issues which might affect Korean

students syudying in Australia. These included ;

- continued availability of finance for tuition and living expenses ;
- accommodation preferences ;
- English language training ; and
- institutional infrastructure for international students.

The KCUE/IDP seminar illustrated the theme or lesson to which I referred earlier ; that the elements of international cooperation in higher education will be most effective if they are seen in the broader context of system to system linkages. For example, efforts by Australian institutions to recruit full fee paying Korean students may be successful in the short term if conducted in isolation or in only a straight commercial context. But they will be conducted in isolation or in only a straight commercial context. But they will be enduring and of more value to both sides if they are conducted as elements of a broader relationship ; one that recognises that a purpose of the full fee program is to make a substantial contribution to higher education in Korea by providing a supplementary opportunity for Korean scholars to broaden their educational and cultural experiences. It should also be accompanied by other elements of cooperation such as are proposed in the continuing IDP/KCUE link.

Internationalization of Inter-university Cooperation: Prospects and Problems to Overcome

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The importance of inter-university cooperation across nations is heightened in light of the historical development of universities, the advancement of learning and scholarship, industrialization and the imminent advent of info-oriented society.

As its history shows, higher education began its evolutionary process of development by cutting across city states in earlier times, centered around Athens, Rhodes and Alexandria. Scholars and students were free to move from one city to another, thus transcending geo-political limitations.

The genesis of what is known as university today is 'guild' which was formed by scholars and students from various city states. The liberal arts education in Chartres, theology and liberal arts education in Paris, law in Bologna, and medical science which grew out of encountering among Greek, Arabic and Hebrew medical sciences in Salerno were the specific examples of higher education evolved from the collaborative attempt of city states.

Humanity movement since Renaissance and the development of higher education as an institute can be considered in the interstate context. Institutional development has been fueled by nationalism emerging in such states, and it made the most remarkable progress during this period, laying the foundation for its further growth into what is known as the universtity. Higher education was the paramount concern of each nation, but there is no denying that it would not have developed into the present stature if it had not been for the cooperative attempt of nations.

In no time in history has the importance of international cooperation been more acutely appreciated as it is today. In view of a highly industrialized, info-oriented society to come, it can be safely said that the institutional development of higher education will be hampered unless individual efforts are elevated international cooperation. New environmental factors create pressure for the university to be opened and diversitied.

Cognizant of new importance attached to the internationalzation of inter-university cooperation, this paper attempts to probe into new possibilities for international cooperation among universities. Major issues, problems and also strategies to tackle the problems are being examined.

1. Prospects

As potint of discussion hopefully leading to prospects for the internalization of inter-university cooperation, some projections are made based on the on-going trends.

First, an inter-university cooperation across the nations will gain momentum, as the world is reduced into a global community. The modern society shows a shifting trend of attention from national to international concerns. Providing an added impetus is an on-going trend toward industrialization and info-oriented, democratic society. New technologies

of communication and transportations brought about a dramatic advance of information media, which in turn expanded the geographical span of life. Technical advance will accommodate different communities into a closely knit network of information, and interdependence among nations will become an integral part of our life. National development in economy, politics, science, education and sports will be dependent, to a considerable extent, on the degree of interdependence among the nations, with the resultant climate which favors coexistence defying ideological confrontation. From all indications, a newly emerging milieu is sure to encourage and support inter university cooperation across the world.

Second, with inter-university cooperation heighened to international cooperation, the time is high to bind people in a collaborative attempt to work for the realization of the common goal of mankind. As the world is reduced into a global community, the common goal of mankind stands out as the supreme concern of each nation to which national goals will be subordinated.

The university will be confronted with new tasks-to put an end to the century-old ideological confrontation and strifes among nations. All universities should share their resources and potentials to define common goals which serve all nations and to chart, within the frame of the defined goals, a new path to enhance the quality of education and research.

Such global issues-as environmental pollution, contagious diseases, regional balance in econmic growth, and political democratization, educational welfare-may will form the themes of joint research involving multi-nationalities. Scientific discovery should be directed by moral sensitivity toward constructive purposes contributing joint research is the surest way to effect cooperation among universities, and the universities, by doing so, grows in the capacity to realize its grand goals.

Bertrand Russell once signaled a warning against science controlled by the government to serve its own interests, for science will release a formidable destructive power. Further, he asserted that scientific advance be guided by moral principle to be in the best interest of peoples in the world. It is through inter-university cooperation that scientific discovery diverts its attention from destructive to constructive purposes. The global university should find its role in education and research in the context of promoting the common goal of mankind.

Third, it is through the international cooperation that learning and scholarship are developed, with excellence in education maintained. We are experiencing an unprecedented proliferation of knowledge, and the turnover of knowledge is accelerated in a cycle of 5 years. No nation can 'go it alone' in developing universities in situation which defies prediction of what is in store for the future. Neither is it possible to catch the ever-receding horizon of advancing science by a nation which is short of supports from other nations. The international cooperation enables each nation to keep abreast with the rapidly advancing frontiers of knowledge. Inter-dependence has become an integral part of the contemporary life. Without it, a nation is bound to lag behind other nations, specially in natural science and technology.

To ensure a steady development of learning and scholarship, the inter-national cooperation

should be promoted in a way that renders all universities inter-dependent across cultural and geo-political bounds.

Fourth, the international cooperation is a way to reduce the cost of higher education. Higher education, which remained in the shadow of ivory towers serving a few elites, is now reaching masses of people. This trend is precipitated by egalitaranism and social trnasformation. The popularization of higher education begets anther problem which compels a concern about how it can be reasonably accessible to every one who wishes to pursue. The limits of financing higher education are matters of serious concern. There is a strong worldwide tendency to hold the government responsible for financing it. There comes into existence an inter-university cooperative scheme in each country. If this scheme is heightened to the international level, the development of university will be facilitated. Intensive investement in the areas of common concern will stimulate research in these areas and the sharing of resources, with a resultant reduction in the cost of higher education.

Fifth, the internationationalization of inter-university cooperation leads to a balanced development of higher education. Higher education is on different levels of development, and the gap is prominent beween nations, between regions, and beween disiplines. In the first place, the international cooperation assists in balanced developments in politics, economy and social welfare, which form major environmental factors for educational development. Further, it will pave the way to balanced development of higher education across nations resulting in healthy growths of universities functioning as important contributors to the world peace.

Sixth, the techological development facilitates the inter-university cooperation. Foremost in our thinking of its instances is the advancing technology of communication : computer made it possible to establish an information exchange network which links universities throughout the world. In a new era of information revolution it is the fact of life that universities should share new information, and this new possibility is hailed as the beginning of what follows to bring world universities into a closer cooperative network.

It is equally important to make efforts to apply new technologies to instructions and researches, since they suggest new possibilities for the quality of education and research. Hence, the international cooperation among universities largely depends on the degree to which modern technologies are utilized in the process of education and research.

2. Strategies

The way to internationalize the inter-university cooperation may be discussed from different dimensions. This paper highlights a few of the ways which deserve of more attention among others for their relevance to our reality.

First, a joint development and operation of curriculum is the common form of the inter-university cooperation. This may be made possible by forming a consortium of universities across nations or by establishing sistership relations. The former requires that a cooperative network be formed by discipline or a university cluster, which allows for free trafficking across universities. It is the joint responsibility of universities forming a consortium to develop and operate curriculum. This presupposes that and accreditation system be established,

which recognizes credits earned at other universities. The latter suggets a reciprocal exchange of students and faculties and faculties between the concerned universities according to a bilateral agreement.

The two schemes are based on the premise that each member university be open and flexible in curriculum development and operation. It would be wise to begin with the areas of studies which serve their common interest. Field studies or area studies are a good starting point before the cooperative venture is extended into other areas of studies path to a high quality of education.

Second, a joint research involving multi-antional universities is a viable alternative. The relevance of this approach stands out in relation to the reigning issues of global concern, which requires a longitudinal study. Research on such a scale necessitates the differentiation of the role among the participating universities or nations. The results of the joint research are used to serve common interests of member nations and mankind. In view of the limited availability of human and financial resources in undertaking joint research on the part of member universities, the government's involvement, specially in the form of financial commitment, offers a breakthrough. The differentiation of the role will go a long way to enhance the quality and the efficiency of the research by avoiding the waste of resources coming from the duplication of the same or similar research projects.

Third, the international cooperation makes it possible for universities to share inforamtion and materials. The exchange of information is facilited by advancing technologies. The wonders of technology also await to be dramatized in the process of instruction and research. It should be born in mind that the effort to realize the potential strength of technology in education would result in the invigoration of international cooperation among universities.

Specific instances of cooperation are the sharing of library resources, softwares and media and the exchange of information on new pulications and materials. Apparently, these will help much to reduce regional or national gap in education and research.

Fourth, a joint sponsorship or hosting of international seminars and joint publication of research reports are anther way to promote the international cooperation. The international seminar serves as a forum for the exchange of ideas among participants and stimulates professional growth of them. Since this gathering represents different countries, the participants benefit from actual contacts with their counterparts from other countries and shape an international perspective which brings their own prejudices and fallacies into sharp focus. This stimulates new ideas. The joint hosting of an international forum necessitates a joint publication of reports on it, translated into different languages so that they have a ready access to the largest number of potential readers.

Fifth, a faculty and a student exchange program is vital to the development of international sensitivity. The existing programs which limit the number of faculty members and students to be exchanged should be expanded in scale and the number of participants to the point of critical mass sufficient enough to ensure the prevalance of a new climate filled with mutual understanding. The exchange programs have the mandate of imbedding international sesitivity which helps the participants to be attentive and accommodating to ddifferent

cultures and motivated to establish cooperative relations with others.

The limited access to formal programs necessitates the expansion of non-formal programs. While the former demands that a certain number of credits be earned, the latter commends itself for being less binding and more various in form, leaving ample room for expansion. The same can be said of professors. Academic activities are not the sole agent for the shaping of positive attitude toward the international cooperation : personal contacts may exert a more powerful impact on their attitude and motivations. Study tour, short-term training, living for acculturation, sports and the like merit as much attention as the formal programs as the facilitator of personal contacts.

Sixth, a mutual accreditation system is expected to provide an added impetus to the interantional cooperation. Certification and qualification system differs from country to country. And a little knowledge or an ignorance of the systems in other countries bemuses decision-making on the employability of foreign-trained applicants. This becomes a major obstacle to the promotion of the international cooperation among universities. Therefore, the development of a mutual accreditation system requires that the existing certificates and diplomas be differentiated in terms of years of schooling, curriculum, and other requirements. These will setve as criteria for qualifications on different leels, to be crosschecked with their equivalents in foreigh countries.

3. Problems and Ways to Resolve

There are many obstacles to the establishment of a cooperative scheme which links universities across nations. To name a few, they read as follows :

The first problem is related to the lack of recognition about the importance of the international cooperation. Although many leading universities appreciate an felt needed for the international cooperation, it falls short of positive support. To them, the international cooperation still sounds like a distant echo and it is accorded a little attention in the hierarchy of priority. If the domant cooperation is to be activated, it should begin with the change of awareness and attitude on the part of university people. The international cooperation among universities is hardly conceivable unless it is brought home to them to realize that no university can grow in its capacity to fulfil the goal of higher education without cooperative relations with other universities.

Second, a closed political system is an anathema to the international coopoeration, politically, each country still shows a persistent adherence to one of the two ideologically split spheres, and the nation's political system is geared to serve the national interests alone to the virtual exclusion of other considerations. Such a political system results in the isolation of a nation from each other. Although this trend is countered by trends toward easing the tension of ideological confrontation, open economic policy and the segregation of politics from economy and liberalization, yet some nations are relatively closed by sticking out to their own interests. The international cooperation among universities is not possible, so far as the political system is dominated by chauvinistic concerns.

Third, a language barrier impeds the international coopoeration among universities. English and a few other languages have been singled out as the common languages of the

world, and the education of foreign language is centered around these few. But the world is not so small as to be covered by a few languages. There are universities which remain out of the reach of these languages. This fact suggests the desirability of diversify-ing the program by increasing the number of languages taught. Problems stem from the lack of willingness and enthusiasm on the part of universities in advanced countries to open up courses on languages of developoing countries and to be accommodating to their cultures. If the courses of languages are limited in number, it will not be possible to establish a cooperative system on a reciprocal basis, though it allows general cooperative programs to be undertaken. The international cooperation calls for variety in terms of the countries involved and reciprocality working to the benefits.

Fourth, an institutional and an administrative parochiality are another obstacles to the promotion of the international cooperation of universities. "Parochiality" begets an administrative or an operational rigidity and the uniformity of programs. What is meant by these words points to the necessity of instilling a sense of openness and flexibility as a way out of the problem.

Besides the aforegoing factors working against the internationalization of inter-university cooperation, social and economic gaps and branch drain need to be mentioned as sobstacles.

In conclusion, it is not only the environmental factors which have negative impacts on the international cooperation but also the numerous internal factors within the system of higher education that affect negatively. The effort to promote the international cooperation requires an attack on both fronts simultaneously. It is encouraging, though, to note that efforts are being made in this direction. But the task of doing away with these obstacles is awesome in magnitude. It calls for the combined efforts of universities and the government to provide a turning point in the move toward the internatioinal cooperation. The internationalization of the inter-university cooperation is the surest way to dramatize the potential contribution of universities to the world peace and the well being of mankind.

Prospects and Problems in International Cooperation

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As a member of the organizing committee for the previous conference in Tokyo, I take it my responsibility to communicate to you some of the major points raised and discussed in that meeting. In the following I will be doing this along the four major sections all of which are related to the internationalization of higher education : (1) new types of universities, (2) local areas, (3) language, and (4) mode or style of research. In doing this I would like to share some of my reflections on the internationalization in specific connections with these items.

1. Internationalization and New Types Of Universities

The founding of a new type of institutions that look beyond national interests to global or intercultural ones epitomizes the internationalization in higher education. Professor Chung-ying Cheng of the University of Hawaii proposed an original plan to establish what he called an East-West University system. Based partly upon his obervation of the post-modern society where flexibility of studies and cross-cultural studies pravail, Professor Cheng elaborated on the equal part which the new system. With its first campus in Hawaii, others would follow in Korea, China, Japan, and the Southeast Asian countries. When founded successfully, he claimed, these would train graduates suited for the coming decades by contributing to the "revitalization and innovation of human cultural values in the East and West traditions." (K. Hara ed. 1988, 223) Apparently with some related concerns, the University of Hawaii opened a Center for Studies in Multicultural Higher Education in view of an improvement of teaching in multi-cultural settings. According to Professors Poppenhagen and Varney, the project would seek those methods from scratch with which fully to develop potentials of those with Asian cultural backgrounds (K. Hara ed. 192-196). The two projects share in common the focus upon culture in the improvement or innovation of higher education, where hopefully the East and West would squarely meet for the first time, perhaps, in history.

In fact such efforts were not without precedent. International Christian University, Tokyo, the site for the last annual conference, aimed to become an institution where the East and West met, For this purpose its faculty and students were supposed to be composed of equal numbers of Japanese as well as non Japanese. Again, the University designated Japanese and English as her official langugages and offered two language training programs for bilingushism ; namely, English for Japanese and Japanese for non-Japanese students, respctively. With more than three decades of such an adventurte, our university had something to share with those interested in the ideas of international univrsity. Analysing the results of the most recent of a series of questionnaire surveys on the educational exper-

iences at ICU, Professor Kazuo Hara noted a few gaps in evaluation between the alumni and the faculty, on the one hand, and the general staff, on the other. The former regarded the international experiences on the campus as the most "useful", the latter placed the same almost at the bottom. For the full realization of the ideals of internationalism the recruitment of capable faculty would be indispensable. Equally significant for this purpose would be a corps of trained and committed general staff. Without the latter, the internationalism in the university would be frustrated (K. Hara ed. 278).

Although the ideas and practices of international universities are valuable in showing new directions and problems, they will not, I believe, from the mainstream of higher education for some more time to come. To meet the need of internationalism, it should be proposed that the major universities in the general and specialized courses in major areas for undergraduates. Ideally these courses should be part of their graduation requirements. Otherwise, as an alternative, in the summer of either the sophomore or junior year, students from Korea, Japan and the Philippines, for instance, take together in Taiwan a few Engish-taught foundation courses such as Basic Chemistry, Ecology, International Polities, Anthropology, Literary Criticism and so on. Such efforts will have to be started for undergraduates because, from the point of view of the mastery of a foreign language as well as sympathetic communion with other people, graduate years are just too late judged against our experience at ICU. Again, numbers of undergraduates with such academic backgounds will facilitate the international student exchanges on graduate levels and will indirectly promote the creation and maintenance of advanced research centers in the Pacific region.

2. Internationalization and Local Areas

If the internationalization so far dealt with pointed to academic centers and to major academic areas, another kind of international cooperations presents distinctly different pictures. Here, localism as well as rather peripheral academic subjects predominate. Professor Rebbeca Stephenson of the University of Guam reported on the state of post-secondary education in the Polynesian Cook Islands. In these areas where itinerary teachers offer post-secondary education through local centers, the major courses consist of Education and Tropical Agriculture. But the teachers thus trained do not win respect from local inhabitants and post-secondary education is not very much associated with agriculture. As a consequence young people and well-educated teachers leave the Islands behind to improve their living conditions and to seek better jobs (K. Hara ed. 89-92). By itself Professor Stephenson's descripition doesn't indicate much of necessary international cooperation. However, when placed by the side of another report by Professor Sheldon Verney of the University of Hawaii, the implications of Stephenson's study become clear. Professor Verney reported that, in the process of training Micronesian youths in health work, University of Hawaii physicians found that in-context learning, rather than merely verbal, was more effective for these people (K. Hara ed. 82-83). Again, according to Professor Michael Hass of the University of Hawaii, agricultural education education and public health stood out as two major foci of cooperation projects in Southeast Asia (K. Hara ed. 75-76). Apparently the Cook Islands

are in need of help from these organized projects of international scale.

The case of Cook Islands has reminded me of the ongoing internationalization in higher education in rural Japan. Largely due to the drain of young people to large cities such as Tokyo and Osaka, many of the local areas in Japan have become increasingly underpopulated for the past few decades. To detain the trend not a few governments have made desparate efforts to invite major university campuses in their midst. The central Ministry of Education has been trying to distribute student populatin all over the country by encouraging the increase in student quota for local universities and discouraging the increase in student quota for local universities and discouraging the same for those located in large cities, but largely unsuccessfully. Having seen that Japanese private universities were less than responsive, more than a dozen local governments actively proposed to host foreign universities. And finally, a local city in Niigata Prefecture succeeded in opening a branch campus of the Southern Illinois University at Carbondale (T. Watanabe, 1988, 80). One should keep in mind that Niigata Prefecture, with its 2.5 million population, had only one four-year college of pharmacy, along with a few national ones, prior to the arrival of the Southern Illinois. At present it is local Japan which needs foreign universities to detain the drain of local youths, and these areas are more internationalized, potentially, at least. Morever, some of the influential Japanese have proposed recently to disperse undergraduate and graduate students from abroad largely to local areas (IDE, July, 1988, 7-9). One should remember that Japan is planning to invite 100,000 students from abroad in about ten years. At this point, these facts and ideas are so intermingled with political and other realistic concerns that one cannot draw easy conclusions from them. Nonetheless, I cannot but perceive more than a more coincidence between the internationalization of higher education in Cook Islands of living, including those in urban universities, is in sight, and when some of the older and traditional modes of living and thought have been reevaluated in a new context, the rutal type of internationalization might well be seminal and might have grave consequences upon the future development of higher education in the Pacific region.

3. Internationalization and Language

For both directions of internationalization language is one of key questions. It holds a problematical position. On one hand no one doubts that language is indispensable for the storage and communication of facts and ideas. On the other hand, however, conflicts arise over the spectific medium of instruction and research. A few of the participants asserted on the continuing significance of English in the Pacific region. For instance, Dr. Saburo Ohkita, in his key note address, flatly stated that "English is and will continue to be an international language." Indeed, Ohkita strongly recommended that the Japanese universities should teach in English those students from abroad who pursue specialized studies and problems which their nations confront (K. Hara ed 7-8). Similarly, Dr, G. Shantakumar of the National University of Singapore stressed on the special role of English in Singapore an international education center. The higher education thus enriched by internationalization will guarantee Singapore's point. The lack of textbooks and consistent terminoligies is

reported to hamper the development of business higher education in Malaysia.

More specifically, "the small market size" makes it uneconomical for local publishers to produce local textbooks (Hara ed. 115, 121). A similar problem is reported by Dr. Pairoj Vongvipanpnd of Chulalongkorn University about Thailand where, because of the domination by American business schools, "incentives to write good locally oriented texts for universities are lacking." (Hara, ed 138).

Despite such facts these nations make every effort to replace English with national languages, even in the teaching in business education. Indeed Indonesia seems legally to forbid instruction in any other languages than the national. And yet an immediate cause for the preference of a national language may also be sought in the irrelevance of the materials in English to local needs and practices. For many more years to come those engaging in higher business and other education in Asia may continually confront the dilemma, a dilemma between more universal textbooks in English and more particular nationalism or nativism, or localism.

what can be presented as a viable solution? Whether one likes it or not, most of the national languages in the Pacific Region, including even Chinese, to say nothing of Japanese, will not be an international language in academia within a few decades. As many have already pointed out, an excessive dependence on English might perpetuate so-called "colonialism" in learning. A way out of this dilemma may be found, I believe, in the creation of new academic traditions in the Pacific Region. More specifically, for some more decades to come, we will depend upon English as the medium for international cooperation. At the same time, however, the schoolars in this area, either individually or in collaboration, should contribute to accumulating literature in respective fields or on respective topics written in English, hopefully published in the Region. It seems especially important that international groups of scholars in respective fields or those intersted in common topics of inquiry exchange ideas and hopefully develope text or other materials in English which are sufficiently localized but which, simultaneously, respond to the needs of international readers. In my field of education, relative to some basic areas such as teaching methods, moral education, social change and education, international cooperations, in view of the production of literature in English will bear fruits. The various papers read in the previous meeting on business education impressed me that such is not only possible but is highly desirable in the Pacific Region. For instance, two-part textbooks dealing with general theories on business abstracted from the facts and practices in the region, compounded by the descriptions and analyses of different practices in the major Pacific nations, will be an invaluable asset to students and teachers. Moreover, these may benefit those scholars and others from different regions who are interested in what's taking place here. Difficulties attending such efforts may be legion. Among others, to many in the Pacific area, including Korean and Japanese scholars, English is quite a foreign language. But so were Latin and German to many of the scholars in the thirteenth century as well as the nineteenth. To the extent that meanings of words and their combinations have been, and will ever be, constantly defined and redefined, especially in academic circles, there is plenty of room for us to do the same on limited aspects of English. By so doing, we may be creating a common ground of scholarship in the region

without unduly subjugating ourselves to the Western traditions in scholarship.

4. Internationalization and Modes or Styles of Research

In the scene involving human beings, problems relative to internationalization seem to take emotional and sometimes very serious forms. The educational history of early modern Japan contains not a few such examples. Thus, in part to avoid these troubles (nationalism apparently must have been the major concern), our country replaced most of the Yatoi scholars from abroad with native ones, within a few decades after the Meiji restoration (M. Ishizuki et eds. 1987). Both Korea and Japan virtually preclude foreign scholars from faculty appointment in their national universities, even though Japan had enacted a new law in 1982 in favor of such appointment. By July, 1987, only 55 non-Japanese nationals occupied faculty positions in Japanese national universities, or 0.1% of some 52,000 teaching staff (K. Hara ed. 1988, 35 ; K. Kitamura, 1987, 246 ; Monbusho, 1988, 82). Even when a foreign scholar stays in a different country only temporarily, however, there often occur visceral conflicts. In 1984 an American professor who had taught in Japan a few years published an essay criticizing somewhat emotionally the manners in which Japanese universities were managed. His criticism in turn provoked equally emotional reactions from some Japanese scholars. That a monthly journal in higher education devoted an entire issue to this topic reflected the seriousness of the conflict (IDE, Sept., 1984). Partly in view of the elimination of unnecessary emotional clash, professor Woo-hyun Chung of Korea University stressed on the basic training a visiting professor should receive in the language and culture of a host country. Again, he cautioned on the possibilities that a visiting foreign scholar may produce a sense of resentment among students because of the attitude of cultural superiority on his part. In the words of Professor Chung, international exchange often failed to become the "sharing." (K. Hara ed. 1988, 30).

I belive there cannot be an easy solution to this problem. But, one thing sees certain. The kind of emotional collision taken up here may occur among scholars and students from any nations including those in the Pacific region. It is our problem, pure and simple. Thus, in addition to the study of language and culture which Professor Chung discussed, I would take up the mode or style of academic activities, an item which is apparenty less relevent to cultural conflict. By the mode or style of academic activities, I mean here the manner in which a scholar acquires his professional knowledge. Moreover, I assume that a professor tends to reproduce that manner when he transmits that knowledge to others, especially to students. Suppose that one professor obeys blindly an authority in a certain field of study, then he himself will in turn take the place of that authority before the class. Another professor who obtains his academic knowledge in constant mutual conversations with an authority or authorities, dead or alive, may treat his students mor as friends than as mere inferiors. The most ideally, when a third professor conducts his research cooperatively in constant mutual references with study objects as well as others' works, his interactions with students and fellow scholars may be reciprocal. To be sure the things are not this much simple. And yet, other things being equal, the mode or style of research ordinary professors engage in will be more important than a new administrative post for

internationalization. Indeed, this may hold the key for the success of cooperations among divergent academic institutions on equal terms. Again, seen in this perspctive, no scholar stands neutral to the internationalization. Any scholar in any nation is potentially contributing to, or disturbing, future international cooperations in academia regardless of whether or not he is participating in such directly. The internationalization of higher education is literally evey scholar's business.

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Barriers and Issues in Corporate-Academic Cooperation

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1. Introduction

Knowledge is often defined as understanding of a science, art or technique ; or as the body of truth, facts, information and principles acquired by mankind. This is a static definition. Really knowledge is a continual flow like a river. It runs from the upper stream to the downstream, and as it does, undergoes a transformation. It flows from its origin and operation with pure and basic sciences and information and even the most remote mathematical speculations and finds its way to its down-to-earth, everyday applications by the ordinary run of men.

In the 19th century and before it doesn't seem that the "rivers of knowledge" had existed in the world, although here and there the reservoirs of knowledge might have. Basic researches at the origin did not flow downstream, say, to the practical applications and market place. Into the 20th century, however, the "rivers of knowledge" rose and the rate of their flow started to increase as well. Of late, the unversities where most of the original knowledges are generated and the industries where they are made useful have been interlinked to become adjoining villages, so far as the flow of knowledge is concerned. Refer to Figure 1 which shows a model of knowledge flow from the university to the industry. Today it became inevitable that the industrial and academic sectors find ways to communicate each other, live together, share their unique resources and cooperate, sometimes compete, with one another, to the benefit of both.

There are those corporate-academic linkage mechanisms which are familiar. Of course the most important and unchanging linkage is the producer-consumer relation in which the main product of the university is its graduates, which the industry consumes. Other linkages include long standing, traditional interactions involing monetary donations, research contracts, fellowships, grants, consulting, continuning education programs and the like. See Table 1, in which types of interactions, old and new, between the two sectors are listed, with the change of relative intensity of each with time. In the table are also indicated the major direction of flow of resources or inputs between the two sectors.

Of particular interest are the types of interactions listed on the lower part of the list. Some of these non-traditional linkages rarely existed in the 1950's or 1960's in Korea. But into the 1970's and 1980's these new modes appeared here and there and these and traditional ones on the upper part of the list began complementing one another. They are strengthening, on the one hand, the classic role of the university in teaching, research and social service, and, on the other hand, helping the industry produce newer and better goods and services at better prices with better efficiency.

These new, non-traditional interactions between the university and the industry promoted new, modified and more liberal university policies and procedures. Also this resulted in

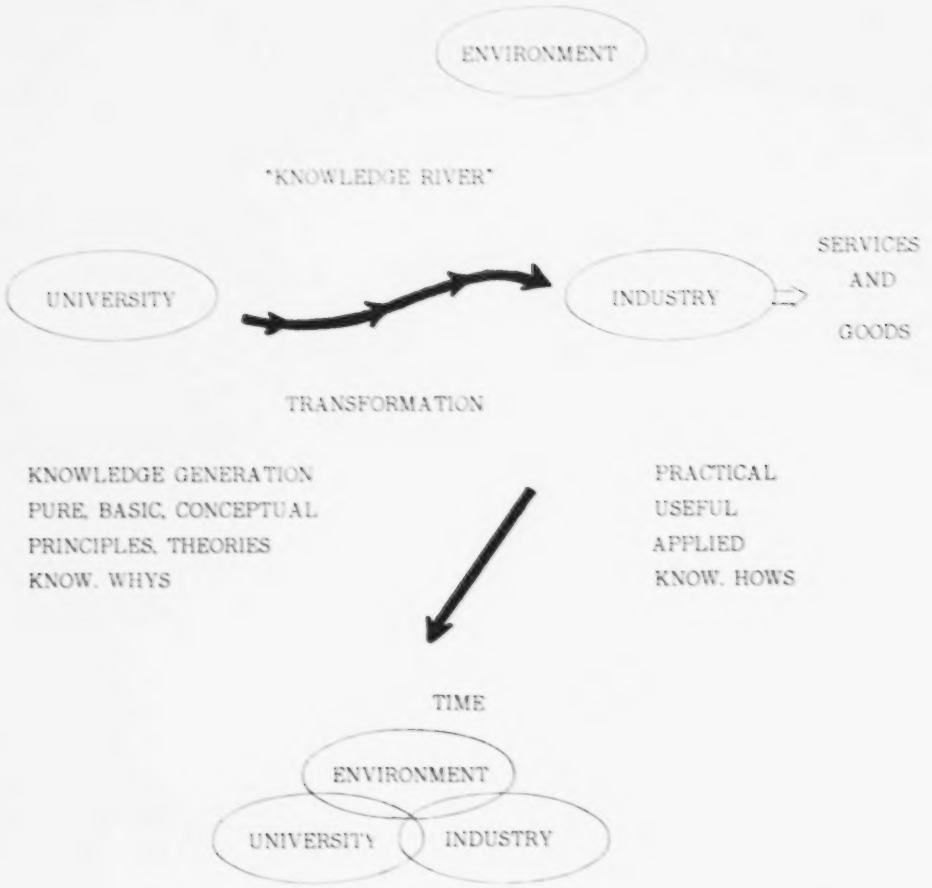

Figure 1. A Model for Corporate-Academic Interaction

better teaching and more efficient research. Benefits go to students as well as faculty members, but the ultimately to the society at large. The industry in Korea now began to recognize that universities are productive forces in the process of technological innovations and they help increase value to the production factors of labor, technology and capital.

Table 1. Traditional vs Innovative Modes of Corporate/Academic Interaction

Modes	Flow of Resources or Inputs	1960's or before	1970's	1980's
· Produce Graduates	I ← U	X	X	X
· Educational Foundations Monetary Donations	I → U		X	XX
· Students Factory Visits	I → U	X	XX	XX
· Fellowship, Grants, Scholarships	I → U	X	XX	XX
· Individual Faculty Consulting	I ← U	X	XX	XXX
· Research Contract	I ↔ U	X	XX	XXX
· Shared Equipment and Facilities	I ↔ U	X	XX	XXX
· Continuing Education	I ← U		X	XX
· Executive Development Programs	I ← U		X	XX
· Short-term Employment of Faculty on Leave	I ↔ U		X	X
· Co-Op Program	I ↔ U		X	X
· Research Park, Science Park, Technopolis	I ↔ U		X	X
· Visiting Researcher (Part or Full-time)	I → U			X
· Visiting Researcher (Part or Full time)	I → U			X
· Research Professor (Full-time)	I → U			X
· Chaired Professor	I → U			X
· Input to Curriculum Development	I → U			X
· Joint Thesis Topic Determination	I → U			X
· Evening Engineering Graduate School	I ← U			X
· Evening Management Graduate School	I ← U		X	X
· Short Intensive Course	I ← U			
· Company Employee-Graduate Student	I ← U			X
· Company Employee-Researcher at University Lap	I ← U			X
· Industrial R & D Association on Campus	I ↔ U			X
· University Extension inside Company	I ← U			X
· Company Research Lab on or near Campus	I ↔ U			X

Table 2. New Courses Offered in Korean Universities

Courses	Date appeared
New Ceramics(Materials Science, Undergraduate)	1980's
Automation and CAM(ME, Graduate)	1980's
LSI Interface Design(EE, Graduate)	1980's
Bioreactor(Environmental Eng, Graduate)	1980's
Laser Electronics(EE, Undergraduate)	1980's
Pattern Recogntion(EE, Undergraduate)	1980's
Industrial Robotics(ME, Undergraduate)	1980's
Numerically Controlled Manufacturing (ME, Undergraduate)	1980's
Artificial Intelligence(Computer Science, Undergraduate)	1980's
Technology Management(Evening Engineering Graduate School, Graduate School of Business Administration)	1980's
Computer Programming and CAD/CAM (Lower Class Engineering, Undergraduate)	1980's
Industrial Organizations(Economics, Undergraduate and Graduate)	1980's
Econometries(Economics, Sociology, and PA, Undergraduate and Graduate	1970's

Today educational and research activities at the university cannot be planned and implemented without regard to the technological and economic activities of the industry. The university has now some awareness of what is going on and what is coming up in the industry. It makes use of the knowledge and input from the industry in establishing its basic policies and planning its programs. Curriculum designs and instructional means in some universities reflect this trend of the times. Thus the old concept of the corporate-academic cooperation began to take on a new meaning.

Because economic development has had a high priority in national affairs of the countries is Asian and the Pacific region, it is quite appropriate that a part of this conference include the matter of corporate-academic collaboration, especially as relates to the developing countries, where human and other resources are insufficient.

2. Issues and Barriers

Of late one observes development of various collaborative efforts, in particular, cooperative R & D activities even among private sector competitors. This may be looked at as new experiments in order to speed the process of technological innovations. But one can focus particular attention to the efforts to build closer collaboration between industry and academia. This is a response to the external pressures for national economic growth and industrialization. Some better-known universities and colleges in Korea, public or private, are extending their traditional role of public educators to becoming key players in programs and projects to stimulate national economic growth and industrialization.

Strengthened corporate-academic linkages are seen as an essential factor in national strategies for promoting economic vitality. New, innovative models and cases of industry-university interactions are being reported.

In Korea there are over 100 four-year universities and colleges and in them some 30,000 full-time faculty members are degaged in teaching and research. They represent over 80% of the advanced degree holders in this country. Approximately 40,000 corporations of small, medium and large sizes are engaged in various technical and economic activities. By way of those linkage mechanisms discussed some members of the two sectors are in close touch with one another. The number and intensity of the interactions in each category and hard to estimate at this time. But there are clear indications that both academic and industrial sectors are puting more efforts and resources into the activities related to those interactions.

While there are optimstic signs of the two-sector cooperation, particularly, between large universities and big corporations, the speed and frequency at which the two sectors come together and work out problems appear slower and lower than desired. Some activities by some pairs of institutions have no substance due to lack of sincerity or enthusiasm by one party or sometimes by both. Some contracts are suspended and activities discontinued. Some research reports prepared by the university teams collect dust unread. Some faculty members refuse to work with industry and some corporate executives do likewise. Middle managers of some corporations feel that most of the corporate-academic interactions are waste of valuable resources-humsn, money and time-on both sides. Responsible administrators in both sectors as well as in government branches are asking what went wrong.

Corporate-academic collaboration has been the subject of many meetings and conferences on the national and international levels. Factors adverse to cooperation appear numerous. They are differences that exist in industry and university with respect to culture, attitude, values, traditions, glals, aspirations, philosopy, etc. Thus the root cause of cooperation or non-cooperation between the two sectors is seen largely attitudinal and value-oriented. Those elements which are said to be different between the two sectors really are "filters" or resistance to change.

In the industry such resistance is found in the organizational level and centers on tradition, conformity, hostility to outsiders, restricted communication and struggle among the power elites. Such resistance does not ordinarily remain in the organizational level, but seeps into the personal level centering on individual habits, perceptions, deprivation, superego, homostasis, etc.

On the other hand the educational sector insists in maintaining its professional orientation and stature to the extent of isolating itself from its environment. Thus its curricular and non-curricular programs are not structured to the needs of industry, sometimes resulting in an output of inadequate graduates, requiring training and retraining. For reasons similar to the above, university research outputs are sometimes found too theoretical, abstract or oversimplified for practical application by the industry.

There are barriers to corporate-academic cooperation other than those of attitudinal or culture-bound nature. They are ones of "hard" nature including, first, excessive teaching and adminstrative loads normally given to faculty members in the universities ; secondly,

lack of basic tools and means necessary for various investigation ; and, thirdly, the fact that the results from industrial research do not render themselves to scientific publications. Unfortunately, these constraints persist in many of the smaller private universities and colleges in Korea.

3. Breaking the Barriers

Of course we all accept that corporate-academic cooperation is both necesosary and desirable. Up to this point we examined the issues discouraging the cooperation, which are basically attitudinal and behavioral arising from misconception, misinformation, value disorentation, mistrust, suspicion and the like. The only way to rectify these is to initiate and implement good communication. To effect good communication, each sector should know what the expectations of the other are. Industry may expect from the university the following :

(i) Curricula responsive to its practical needs
(ii) Continuing education programs for its people designed to meet the growing professional needs of industry
(iii) Access to results of university's researches relevent to industry
(iv) Assistance in identifying industrial and managerial problems and designing research programs to solve them.
(v) Assignment of outstanding researchers to specific industrial projects
(vi) Improved services in the use of the university's library and laboratory facilities

On the other hand, university expects the following from industry :

(i) Teaching assistance in the field of industry's technical expertise
(ii) Guidance in the design and development of its curricular and noncurricular programs
(iii) Financial support for its research programs
(iv) Industrial guidance in developing practical technologies
(v) Financial assistance in the form of scholarships, professorial chairs and laboratory equipment
(vi) Opportunity for its faculties to undergo industrial training
(vii) On-the-job training for its students

Being aware of each other's expectations, someone has to make the first move. Along this line, the consensus is for the university to initiate the big move toward effective communication.

First moves are always critical. A wrong move could jeopardize the program. Thus, armed with the knowledge of industry's expecatations, the university should use tactics and sound strategy that would project its strengths without knowingly or wilfully concealing its weaknesses. It could send feelers to industry's top management suggesting its good intent of entering into a joint venture which shall be mutually beneficial. A dialogue could be arranged with top officials of industry and university in attendance for the creation of an advisory body which shall ensure that programs of cooperation are relevant to their needs and within their capabilities. It is of vital importance that top management in the two sectors lead and be actively involved in the initial stages of establishing programs of

cooperation to provide encouragement and support to those who shall take over in the opterational stage. Involving top management in the initial stages will provide better chances of success.

4. Conclusions

In the presentation an attempt has been made, albeit limited in supporting data and to a large extent based on personal bias, to present a perspective on the university/industry corperation in Korea, where it has come from, where it is today, and where it is going. The restructuring of industry and of trade patterns throughout the country and the world has created tensions and difficulties for the Korean industry, particularly due to the lack of skilled manpower and useful industrial technologies and knowhows. These tensions and difficulties, however, provided the academia new challenges and new opportunities. A number of new industry-university linkage mechanisms were created and old ones activated. Today the two sectors are seeking ways to live together, share their unique resources and cooperate with one another, to the benefit of both. But the rate of adoption of any cooperative methods hinges on its perceived effects to the institution. The university must make its first move of communication with industry for cooperative undertakings in the areas illustrated. The probability of success in these ventures appears high and increasing.

Imminent Practical Aspects of Engineering as Legitimation of Cooperative Education

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1. Context of Topic

The term *Cooperative Education* expresses the necessity of cooperation between institutions of education and employers for educational programs which systematically combine academic studies with practical vocational experiences. It is expected that this cooperation will enhance the graduates' professional competences. The topmost aim of these programs is not the cooperation itself, but the establishment of a thorough and educationally fruitful connection of theory and practice which can be rendered possible only by such cooperation. Thus, it appears to be obvious to reflect upon the specifics of the relationship of theory and practice in the various academic fields. We shall deal here with the special case of engineering and technology.

In the context of this conference with participants mostly from Asian countries it may be worthwhile for a better mutual understanding to mention the *historical development of engineering science and education* as it took place in the western industrialized countries. In the U.S.A., for example, three overlapping phases with different accents can be roughly distinguished(Winkler, 1984) :

(1) The *transition phase* from vocational training to higher education : The development from a more or less formalized training on the job to systematic courses and to the establishment of faculties of engineering(end of 19th until beginning of 20th century).

(2) The *engineering science phase* : Natural sciences and mathematics are understood and taught as the basic sciences of engineering. Graduate schools and Ph.D. courses are being introduced(20th century until after world war Ⅱ).

(3) The *socio-technological phase* : Application of engineering knowledge and methods in wide areas of public concern and development of overlapping areas between engineering science and all other scientific disciplines(from the early 1960s on).

In particular the latter phase was mainly propelled by research programs of the Federal Government. Programs like RANN(Research Applied to National Needs, 1971) and IRRPROS(Interdisciplinary Research Relevant to Problems of our Society, 1969) initiated reflections about contribution to the society's progress. The result was a considerable shift from rather natrual science oriented research towards application oriented research with the demand to achieve better solutions for the society's actual problems. Many results of the broad discussions in those years have contributed to a deeper understanding of engineering and technology. This paper refers to some of them which are still landmarks for the education in the field of engineering in these days.

In temporal coincidence with the beforementioned third phase of developoment in engineering science and education, the number of engineering courses with cooperative educational programs at colleges and universities in the U.S.A. rose sharply in the 1960–1980 period. Starting with 29 courses in 1946, the number climbed to more than 900 in 1960, proceeded to more than 1100 in 1979 and to 1200 in 1984. Most of the courses(90%) in this period had 100–500 students, some 500–1000 students(6%) and 1000–3000 students (4%) (The Cooperative Education Research Center, 1978). In the same period the idea of cooperative engineering·education programs developed towards a more and more educationally and didactically reflected and guided off-campus learning activity as an integral part of the curriculum.

The commonly acknowledged criterion for a cooperative program is that experiences in real situations of vocational work are an intergral component of the educational process. Differences occur when it comes to the pedagogical sense or intent of such practical studies. At Laguardia Comunity College in New York City, e.g., these practices are understood as the *field of work* in which the abilities acquired at college are being applied in real vocational actions. Against that, at Northeastern University in Boston e.g. such practices are being considered rather as *field of scientific reflection.*

This paper will refer to the latter for two reasons mainly.

First : The development of engineering from a mere practical discipline to a sceintific one was closely connected with broadening and deepening its theories on the basis of natural sciences and mathematics. Therefore, laying emphasis on sophisticated theories and their scentific basis is indispensable for teaching engineering at college. However, in doing so the genuine practical intent of engineering science is endangered to become stunted. Encountering real engineering work may initiate scientific reflection towards recognition that the practical roots of this discipline are still vital and that engineering means more than mere application of natural laws.

Second : As an impact of Confucianism, the education in Korea and other countries of this region developed an extreme orientation towards pure theory. Engagement in practical matters as part of the educational process does not pay off in terms of social reputation. If this is still true–and that can be assumed to a considerable degree, especially in higher education–how specific solutions for the countries and societies concerned ? A plausible possibility to deal with this issue in mutual understanding is to concentrate first of all on students' vocational practices as a "field of scientific reflection".

For encouragement in this direction, some epistemological issues are presented in this paper. The intent is to show that a scientific and comprehensive understanding of engineering and technology leads to the practical roots of science in this field and thus to legitimation of theory based, but nevertheless practice-oriented education in engineering, which to enhance is the overall aim of cooperative education.

2. Practicability as Specific Criterion for Engineering

During the above mentioned socio-technological phase of development of engineering as a sophisticated profession, the engineers found their image harshly damaged by the following saying which almost assumed the status of a cliche :

> Every rocket-firing that is successful is hailed as a *scientific achievement* ;
> every ont that isn't is regarded as an *engineering failure*.

This little epigram is not cited here to enter again a discussion which took place more than 25 years ago. But it still dramatizes the confusion in which we have been foundering, concerning answers to the questions what *science* and *engineering* are like. It tells us that it is important to clarify our thoughts about these two words because the distinction is central to an engineer's understanding of what he is doing and why, and for whom it is being done. The question is not "whether a man doing a particular piece of work calls himself a physicist or an engineer. But comprehension of the fact that physics and engineering are indeed different professional missions, is essential"(Stratton, 1961).

However, it is extremely difficult to define a clear and sound distinction between science and engineering as far as their objects and methods are concerned. Both are closely interrelated, depend on each other and show overlapping in various fields. One result of the broad discussion in the 1960s was to refrain from perfect definitions which are acceptable for everyone. Instead, simple explanations should be used which lead our attention to the different concepts behind them.

Let's take the most interesting comparison of *natural science* and *engineering science* for example. Although dealing often with the same objects(the natural and artificial world around us) and applying the same methods(e.g. experiments), the difference appears in their goals. Natural science concerns itself with what it is, engineering and its science with what it is to be(Skolimowski, 1968). The question in natural science is primarily whether a theory is "*true*", whereas engineering science questions primarily whether a theory proves itself *sound in applications*(Muller, 1967). Therefore practicability("Machbarkeit") is the genuine and overall criterion for engineering in theory and practice(Rumpf, 1969).

This criterion is a great challenge in engineering education nowadays. As we know, a primary reason for requiring engineers to have a college education is to provide them with the tools of *analysis*--and mathematics is the most powerful of these tools.

From my experience with students in engineering in Korea I learned that the majority of them is so deeply impressed by the power of mathematics in physical problems that every engineering activity is perceived only in its mathematical formulations. When dealing with programmable control devices in an exercise for example, our students had to generate programs for different practical cases of process control. They showed great reluctance to have their programs undergoing a practical test, arguing that they had checked their programs on the paper several times. When the test was done finally with models, the students realized that in many cases readjustments appeared to be necessary to achieve the intended functioning of the given hardware.

Thus, it serve the full understanding of the function of theories in engineering when the students get the chance for practical studies to experience the decisive criterion of practicability which rules the thinking and all efforts *in engineering*.

3. General Restrictions for Pure Theoretical Solutions

Scientists primarily produce *knowledge*, engineers primarily proceed *things*. Engineering is fundamentally committed to the translation of scientific facts and information to create machine, structures, materials, processes and the like that can be used(Walker, 1961). In providing engineering with up-to-date knowledge, *engineering science looks for knowledge for the sake of doing* (Bunge, 1966). But the generated knowledge and theories don't reach that far to lead directly to acceptable technical solutions of a given problem. That is because various non-technical factors are involved in getting a technical solution approved as an apropriate one.

The free room for actions in engineering is being narrowed by several restrictions. Covering the entire spectrum of potential limitations for the engineers' work, Rapp(1978) distinguishes seven levels and qualities of restrictions. Starting with the general conditions for generating and applying theories and proceeding to a finally approved technical solution, the following order of demands on engineering work shows an increase of restrictions which narrow the engineer's free room more and more :

(1) logical consistence
(no logical contradictions are allowed)

(2) following natural laws
(no chance for solutions which violate natural laws)

(3) state of recongnition and knowledge in natural science
(only the actually provided knowledge about natural laws can be utilized for technical solutions)

(4) state of arts in engineering
(knowledge about natrual laws alone does not provide information about the behavior of a particular technical system)

(5) available material and personal resources
(these resources are limited by principle and their availability varies from situation to situation)

(6) acceptance of solution by market and/or client
(the respective priorities of valuation have to be met)

(7) political and legal restrictions
(e.g. safety and environmental regulations).

Items 1 and 2 refer to the *structure of the natural* world, items 3 and 4 to our *intellectual resources* mainly. Learning to deal with both is the domains of engineering

education at college. From item 4 on *optimizing* is required which is an essential objective in engineering education. To create compatibility of theoretical possibilties and approaches with given practical conditions and demands is at the core of engineering. But the latter is not generally introduced yet as objective in engineering education.

When I discussed the various possible solutions for a given problem with my Korean students according to some developed criteria, they had to try very hard to refrain from questioning for the sole and very best solution. *Thinking in alternatives* to meet at the best specific conditions in a given practical situation appears to be strange for young people who are used to achieve solutions on a strict nomological path of thinking.

A survey among mechanical engineers in West Germany has shown that the engineers' profile of abilities was to 25% occupied by non-technical areas and that these abilities had been developed to 80% in their vocational practice (Hillmer, Reters and Polke, 1979). Students of engineering are inclined to consider non-technical matters as to be alien to their subject. I think that practical experiences in real engineering situations can help them to understand that *knowledge for the sake of doing* includes non-technical aspects too and that these are of vital interest when it comes to the question of how to be successful with well engineered technical solutions.

4. Final Remarks

The hypothesis here was that practical experience for students in engineering courses may stimulate scientific reflections towards the strongly practice related tasks of their discipline, even though stringent theoretical thinking is thoroughly required. The practical aspect which dominated at the birth of this discipline, but faded out in the course of the discipline's scientific development, is regaining its relevance. Technical solutions are now more and more considered as embedded in a complex socio-economical context which has to be taken into account when educating engineers towards the ability of creating appropriate things and processes. Since the complexity of modern engineering tasks and profession cannot be experienced at college in most of the cases, off-campus practices become more and more important. The cooperative education programs represent the didactically most advanced concepts in this field. But it should not only be propagated under the aspect of doing practical work, but also for gaining a deeper understanding of the specific role of theory in engineering.

When I look at my country, finally, I have to admit that there are only a very few specialized colleges which offer cooperative education programs in its pure sense. Those are some newly established courses in business schools and courses for the education of technologists at so-called Vocational Academies ("Berufsakademien"). But the historical developments of engineering education in my country have kept the practical roots of engineering vital so that reflections about practical impacts of engineering science could prevail. Every student in engineering course at universities is required to spend 26 weeks in industries as a prerequisite for graduation. For students of applied engineering at special engineering colleges ("Fachhochschulen") it is twice that much (2 semesters practices).

In countries where such historical roots of practice oriented engineering education are not existing or became forgotten, I think it would be worthwhile to try the other way round and start reflecting about the role and function of theories for engineers as professionals. From there the practical roots and purposes of thinking and action in engineering and its science could be rediscovered. That gives reason to enhance the program of cooperative education even for a primarily theory oriented or motivated engagement in engineering as subject of higher education.

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Proposal for the Initial Development of a Water Research Center Faculty of Science, Chiang Mai University

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1. Aims and Intentions of the Centre

The Water Research Centre (WRC) is a multidisciplinary team of scientists from Chiang Mai University and Birkbeck College, London, comprising chemists, biologists, geologists, physicists and researchers of other disciplines. The aim of the Centre, at the initial stage, is to study the environment of the Chiang Mai pasin in relation to the productivity and health of the Watershed in the face of agricultural, industrial and urban developments. The topic of principal concern is the effects of pesticides, sewage, and heavy metal pollution on human health and on the ecosystem generally. Other aims include the location of mineral resources and a study of the nutrient status of crops and animals. Hopefully, this will be achieved through the biological and chemical monitoring of the aquatic and related environments at selected stations in the Basin. Analysis of water samples from rivers and streams, as well as groundwater is central to this study. Other factors interacting with water are also important, especially sediments, soils and living organisms. The analytical data will provide information of the current status of the environment, enable trends in contamination to be identified, and allow the movement and eventual fate of toxic materials to be studied. In later stages of the Centre's development, the study will be extended to include other Pasins in the northern part of Thailand, e.g. the Chiang Rai and Lampang Basins.

2. Work Currently in Progress

About twenty sites on the River Ping and in the Doi Inthanon area have been established for regular monitoring. Two visits to each site have been made so far (in July and December 1987). An inventory of the aquatic organisms present at each site has been made. Samples of water, sediment and algae have been collected for analysis. Preliminary results from the water analysis have indicated that downward trends in the level of water quality in the Watershed are, indeed, a cause for concern. Meanwhile, the sediments were subjected to multielement analysis by ICPAES in London and showed point source contamination by several elements, including an interesting concentration of Lanthanum (up to 2500 ppm) in the Doi Inthanon area.

An academic exchange, involving four scientists from Birkbeck college and five from CMU is currently in progress and is being sponsored by the British Council & CMU.

3. Plans for the Immediate Future

A plan for the collection and analysis of stream sediments from 120 selected sites over the whole of the Chiang Mai Basin has been drawn up. Each sample will represent a

drainage area of between 20 – 100 km². The samples will be analysed by ICPAES in London for about 25 elements, and for certain other selected elements (e.g., W, As,) in CMU. Geochemical maps of the data will be prepared which will provide information for : (a) a baseline study of potentially toxic elements in the Basin ; (b) agricultural micronutrient studies ; and (c) mineral exploration activities. This regional survey will enable point sources of pollution to be located and will permit the indentification of particular regions for individual detailed investigation. This project will be funded by CMU (sample collection) and the British Council (multielement analysis) and is expected in be complete by mid-1988.

Plans have also been prepared for a dust and soil pollution survey of the Chiang Mai urban area. Surveys of groundwater pollution in the Chiang Mai City area and in the proposed Industrial area between Chiang Mai and Lamphun are also in the planning stage.

4. Resources Needed

The resources needed for the WRC to achieve its objectives are needed mainly for the monitoring of the selected stations and the routine analysis of environmental samples. This includes items of both :

(a) major equipment
e.g., an ICPAES, field monitoring equipment and

(b) minor equipment
e.g., accessories and spare parts for existing equipment
as well as various other

(c) supporting costs
e.g., consumables, maintenance, services, travel. and manpower.

5. Funds Requested at the Present Time

The funds requested at the present time are for immediat expenditures such as :

(a) sample collection : 50,000 Baht/year
(b) multielement analysis : 50,000 Baht/year
(c) CMU-Birkbeck exchange visits : 200,000 Baht/year
(d) research technicians (x3) : 150,000 Baht/year
(e) minor equipments, chemicals : 200,000 Baht/year
and other consumables

TRACE ELEMENT ANALYSIS OF THE MAE PING WATERSHED

Collaborative Research between Chiang Mai University, Faculty of Science (Water Research Center) and Birkbeck College (Department of Chemistry and Geology)

Aims :

To strengthen the graduate programes of the Faculty of Science of Chiang Mai

University and of Birkbeck College (University of London) and, in particular, as part of a survey of the Mae Ping watershed conducted by the Water Research Center (Chiang Mai University, Faculty of Science) to

1. develop methods of multielement analysis at the Water Resarch Center.
2. conduct joint trace metal analysis of river sediment and associated water samples.
3. assess the degree of metal contamination of the Mae Ping watershed and predict the watershed's capacity to withstand future pollution.
4. plan and conduct systematic sediment and water sampling so as to produce element maps of the Mae Ping watershed
5. use the results of the analysis to indicate localities where further geochemical exploration might prove fruitful

Rationale

Pollution by heavy metals, particularly by mercury, cadmium and lead, is one of the health hazards which the development of civilisation may bring to a river. Despite some analysis by workers at Chiang Mai University, little is known about the metal content of the Mae Ping river or of its associated surface and ground water systems. The population of the region is increasing. Clearly the concentration of a range of metals in the river, surface and groundwater systems, in associated sediments and in filter feeders which may concentrate the metals at successive trophic levels must be estabished and monitored regularly —if occasionally— throughout the seasons.

Analysis of river sediment and of the associated river water furnishes a standard technique of geochemical exploration. In a region where mining has developed as a consequence of the chance recognition of economically important outcrops, the opportunity to extend the monitoring of metal pollution so as to develop systematic geochemical exploration is irresistable. There are nopublished maps of element distribution in Northern Thailand.

Workers in the Faculty of Science at Chiang Mai have published surveys of metal concentrations in the environment which cover a limited number of metals and a few selected localities. The surveys are based on non flameless Atomic Absorption Spectrometry. There is a need to :

1. extend the provision of separate, clean (controlled atmosphere) laboratories for the storage and preparation of a wide range of samples. Such laboratory facilities already exist in various parts of the Faculty but the resources are insufficient to handle the large number of samples that the Water Research Center will provide in future. Ultimately the Center will probaly need an emergency electricity generator, limited numbers of voltage stabilizers and increased provision of fume cupboards (hoods).
2. consider such relatively inexpensive methods of trace metal determination as colorimetric analysis, isotachophoresis, polarography (Germany is presenting a polarograph to the Water Research Center) to see whether these methods are suited to the routine analysis of large numbers of samples.
3. perform duplicate analysis at Chiang Mai and Birkbeck to ensure that both

laboratories are obtaining accurate analyses.

4. organise the transmission of samples to Birkbeck for multielement analysis by Inductively Coupled Plasma Emission Spectrometry (ICP).
5. involve the Water Research Center in I.C.P. analysis and, if it seems appropriate, to set up an ICP laboratory at Chiang Mai for multielement analysis.
6. organise systematic retrieval of sediment samples at 1−2 km intervals throughout the Mae Ping watershed.
7. ensure that the analytical resources are able to cope with the work generated under 6.
8. transfer software for element mapping from Birkbeck College to Chiang Mai.
9. set up a computerised data base available to all workers in the Water Research Center.

THE EFFECTS AND ANALYSIS OF PESTICIDE RESIDUES IN THE MAE PING WATERSHED

A collaborative research programme involving Chiang Mai University, Faculty of Science (Water Research Center) and Birkbeck College (Department of chemistry).

Aims :

To strengthen the graduate programmes of the Faculty of Science of Chiang Mai University and Birkbeck College, and, in particular, as part of a survey of the Mae Ping watershed conducted by the Water Research Center, to

1. develop methods of pesticide residue analysis (including GC, TLC and HPLC) at the Water Research Center.
2. conduct joint pesticide residue analysis of water, vegetable and animal samples.
3. assess the degree of pesticide residue pollution of the Mae Ping watershed and of the watershed's capacity to withstand further pollution.
4. study the effect and distribution of pesticide residues at various trophic levels of the subtropical ecosystem.

Rationale

Whilst the most obvious problems of the Mae Ping watershed are those associated with the urbanisation of a eutrophic, subtropical ecosystem, the most dramatic pollution may well be due to pesticide residues. Pesticides, both those recommended by the Ministry of Agriculture and others, not recommended but available on the open market, are used extensively by farmers and have increased agricultural productivity very significantly. Agriculture is, of course, the dominant component of the Thai economy. Concern for the effects of pesticide residues of the Mae Ping watershed, notably at the King's Project on the slopes of Doi Inthanon, has led the Ministry of Agriculture to request the urgent help of the Water Research Center in conducting appropriate aralyses.

In the past, satisactory thin layer chromatographic analysis of pesticide residues has been obtained by Dr. Saowanee Rattanaphani at Chiang Mai. The usual method for the

analysis of pesticide residues of PCBs (poly chloro biphanyls) is gas chromatography using an electron capture detector. Another possibility would be HPLC (High Performance Liquid Chromatography). The guidance of the Analytical Center at Birkbeck College in the development of pesticide residue analysis at Chiang Mai would be invaluable.

The passage pesticide residues through trophic levels of the subtropical eccosystem is of interest to both Chiang Mai and Birkbeck College. It may be that marker organisms could provide the simplest means of identifying pesticide residue pollution and this requires multi-disciplinary study involving the Biology department at Chiang Mai.

The controlled use of pesticides in Northorn Thailand has high priority amongst the interests of farmers, the Ministry of Agriculture, the FAO and all aidgiving agencies.

Table 1. Collaborative Agreement for Academic Exchange and Cooperation between Chiang Mai University(CMU) and Foreign Organizations and Institutions

	Foreign Organizaion/Institution	Agreement to be signed	Type of Cooperation*
1.	U.S.A		
	1.1 University of Minnessota (Duluth)	July 18, 1986	4
	1.2 Sparkman Center	July 2, 1986	4
	1.3 California State University (Long Beach)	May 7, 1986	4
	1.4 University of Wisconsin (Madison)	June 25, 1987	4
	1.5 U.S Exchanges	December 25, 1985	4
	1.6 University of Colorado	June 21, 1986	2
	1.7 University of California	October 2, 1987	3
	1.8 University of Illinois at Chicago	May 12, 1987	4
	1.9 George Peabody College for Teachers of Vanderbilt University	November 12, 1987	4
	1.10 Upland Social Foresty Pilot Project (USFPP)	June, 1987	2
	1.11 Louisiana State University	March 18, 1988	1, 2, 3
2.	SWEDEN		
	2.1 Uppsala University (Physics)	June 4, 1985	3

	Foreign Organization/Institution	Agreement to be signed	Type of Cooperation*
3.	JAPAN		
	3.1 Nippon Medical School (Medicine)	August 14, 1986	4
	3.2 Seikei University	November 24, 1985	4
	3.3 University of Ryukus	July 27, 1987	1, 2, 4
	3.4 Kyoto Seika University	June 14, 1988	1, 2, 3
4	AUSTRALIA		
	4.1 La Trobe University	January 9, 1987	4
5.	FEDERAL REPUBLIC OF GERMANY		
	5.1 University of Passau	October 1, 1987	1, 2
6.	CANADA (International Linkage Programme -CIDA)		
	6.1 Ryerson International Development Centre (RIDC)	May 29, 1987	4
	6.2 University of Victoria	July 2, 1987	4
	6.3 University of Manitoba	July 21, 1987	4
7.	KOREA		
	7.1 Pusan University	December 17, 1987	1, 4

* Type of Cooperation

1. Exchange of faculty members/staff
2. Research cooperation
3. Joint postgraduate/study programs
4. Academic cooperation and support services such as libraries, workshops, administration, equipment, etc.

Table 2. Academic Cooperation between Chiang Mai University and Foreign Organization and Institutions without Signed Agreement

	Foreign Organization/Institution	Type of Cooperation *
1	U.S.A.	
	1.1 Princeton-in-Asia	1
	1.2 University of Illinois at Chicago	1,4
	1.3 Saint Olaf College	1,3
	1.4 University of Nebraska	2
	1.5 New Mexico State University	1
	1.6 University of Colorado	1
2	SWEDEN	
	2.1 Uppsala University (Biotechnology)	1,2
3	ENGLAND	
	3.1 University of Surrey	4
	3.2 Leeds University	4
	3.3 University of Reading	1,3
	3.4 Birkbeck College	1,3
	(WATER RESEARCH CENTER)	2
	3.5 Herbal Medicine	
4	JAPAN	
	4.1 Nippon Medical School(Nursing)	1,4
	4.2 Japanese Council for Medical Training Program(JCMTP)	1
	4.3 Showa University	1
	4.4 Nanassato Hitech Medical Center	1
	4.5 Cancer National Institute of Japan	1,2
	4.6 Osaka University	1,2
5	AUSTRALIA	
	5.1 Hawkerbury Agricultural College	1,4
	5.2 University of Melbourne	1
6	FRANCE	
	6.1 INSA	1,3
7	ITALY	
	7.1 International Centre for Theoretical Physics(ICTP)	1,2
8	CANADA	
	8.1 Quebec	4
9	INTERNATIONAL ORGANIZATION	
	9.1 ASAIHL	4

Agreement
between
Chiang Mai University, Thailand
and
Pusan University of Foreign Studies, Republic of Korea

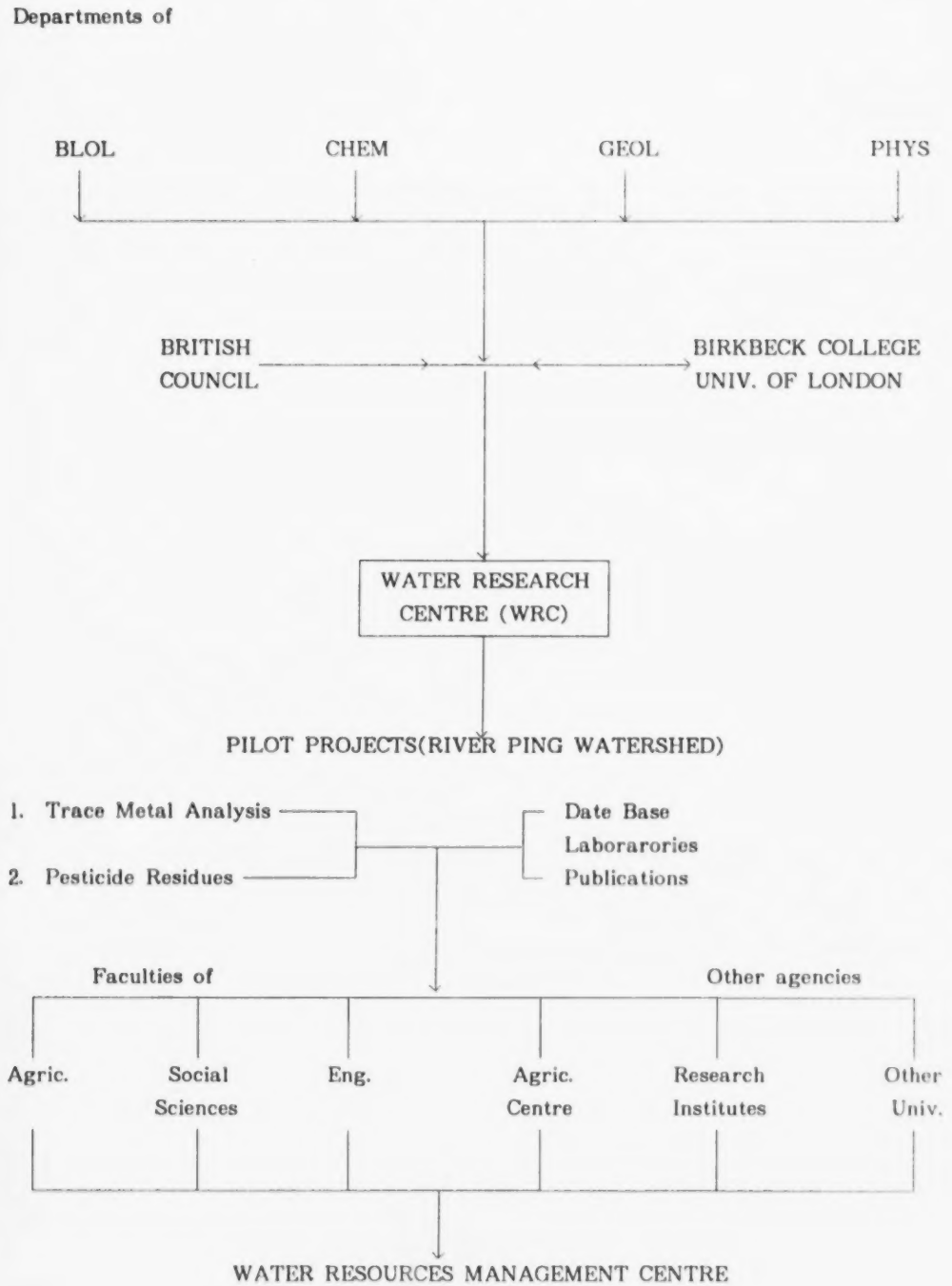
Whereas, Chiang Mai University, hereinafter referred to as CMU, and Pusan University of Foreign Studies, hereinafter referred to as PU, believe that the educative process at their respective institutions would be enhanced by their academic exchange and collabortion,

Now therefore, the parties hereto hereinafter agree as follows :

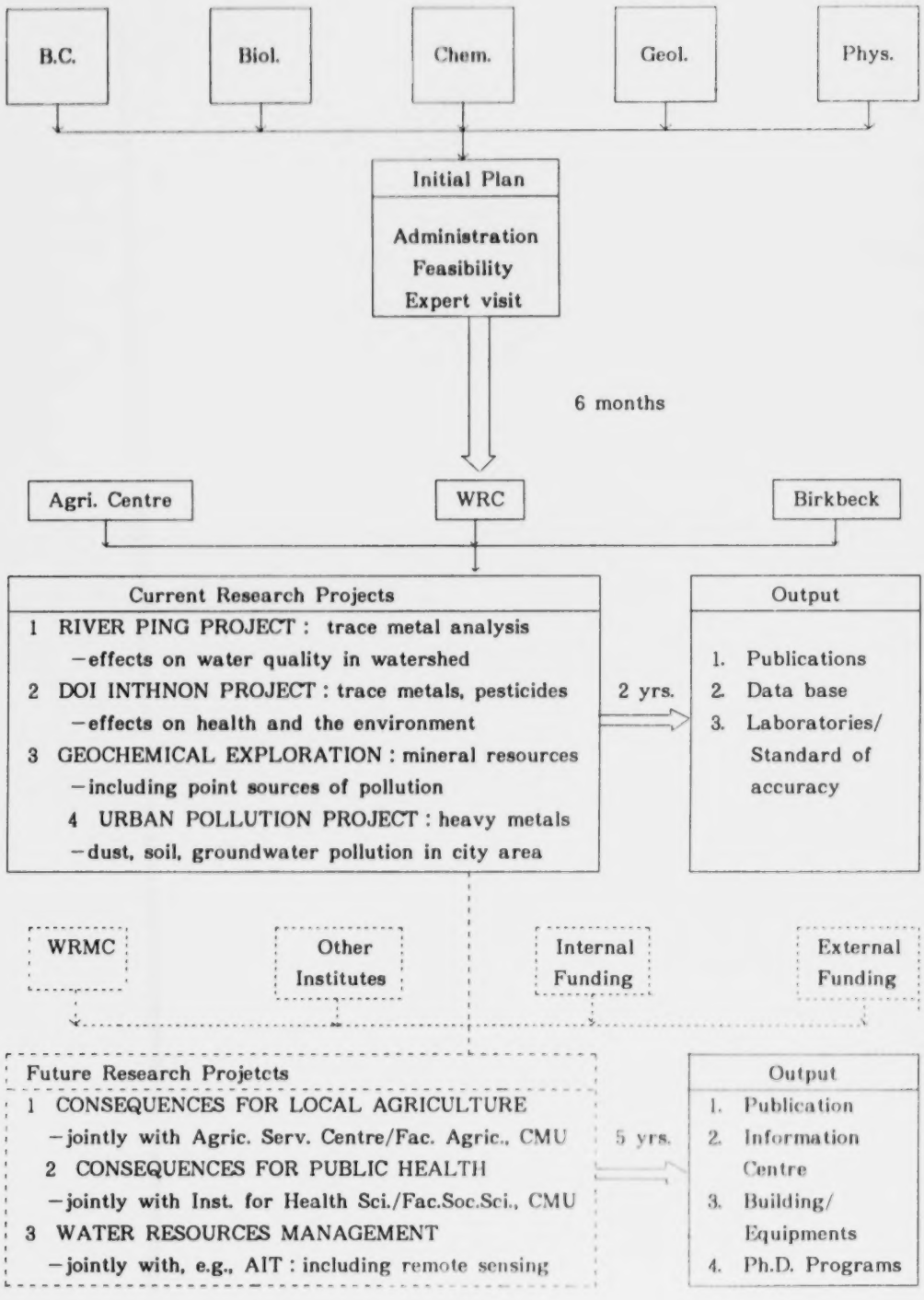
1. CMU, upon request from PU, will provide a suitable number of qualified faculty members to teach, do research or to perform other tasks which are mutually agreed upon at the latter.
2. CMU, upon request, will organize a short term program (1−2 semesters) in the area of Thai Studies for PU faculty members and/or students. And in the future, with cooperation and assistance from PU, a Korean language programme may be established at CMU.
3. Either institution will use its best endeavors to facilitate and accommodate visiting students or faculty members from the other institution.
4. CMU, with finacial support from PU, will produce relevant instructional media for PU.
5. Either institution, upon request from the other institution, will provide papers and proceedings of the seminars and/or workshops conducted at its institution. Exchanges in other related areas will also be made whenever appropriate opportunities arise.
6. Costs and expenses arising from or to implement the activities pursuant to No. 1−6 will be nogoiated on a case-by-case basiss.
7. CMU and PU will jointly proceed on the basis of this Agreement and seek to establish details of each activity in the future.
8. This Agreement will become effective on January 1, 1988 and will continue thereafter for 5 yeras.
9. This Agreement will be subject to modification and extension by mutual agreement. Similarly, this Agreement will be subject to termination upon notice in writing communicated from one party to the other at least 5 months before the date of termination.

For Chiang Mai University	For Pusan University of Foreign Studies
Title Rector	Title President
Date December 17, 1987	Date November 20, 1987

WATER RESEARCH PROJECT



WRC Flow Chart



The Colombo Plan Staff College for Technician Education : An Example of Successful Cooperation between Developed and Developing Countries

David Chantrill
Colombo Plan Staff College for
Technician Education, Manila, Philippines

1. Background

The Colombo Plan was formed as a result of a British Commonwealth Heads of Government meeting in the late 40s and has involved itself in a wide range of economic development activities within its member constituency. In 1964, as a result of Australian proposals, the Colombo Plan broadened its scope to include intraregional technician training. From then to 1973 a total of 7,300 persons received training in neighboring countries. India was the principal donor.

Experience gained from the intra-regional programme led to the Colombo Plan Council's interest in training technical teacher educators. This, it was hoped, would accelerate the training of technicians by enabling member nations to develop their own national programmes for technical teachers.

The concept of a regional centre for technical teacher education originated through the efforts of delegates from the U.K. and U.S.A., who jointly proposed such a regional centre at the Third Colloqium on Inter-Regional Technician Training in Singapore in April 1969. The assembled delegates endorsed the concept. The proposal was then discussed at several Consultative Committee meetings. A feasibility study in 1970, and a further study in 1971, were conducted by experts from member countries.

Continued Colombo Plan action led to the drafting and later adoption of the Memorandum of Understanding to create CPSC at the 23rd meeting of the Consultative Committee in Wellington, New Zealand in December, 1973. The Memorandum later functioned as a Charter of the Staff College. Together with the Plan of Operation and Development it provided the foundation for CPSC to begin functioning in late 1974.

CPSC was shaped in the image of the Colombo Plan and became the organisation's first project whereby funding would be provided cooperatively by all member countries. It linked an institution-based capacity and capability with a diverse environment of twenty-one regional member countries. It aimed at functioning as an instrument of regional cooperation, and its mission was to impact broadly upon the further expansion and refinement of technician education and training. Its constituency would be key stakeholders in regional countries which had responsibilities for such development. Presently there are seventeen active regional countries and four non-regional countries.

2. Governance

CPSC's governance comes through the participation of several Colombo Plan entities, most notably the Consultative Committee and the CPSC Governing Board. The actions of

these two groups provide the basic authority and policymaking structure for CPSC.

Consultative Committee

The Consultative Committee responsible for the creation of CPSC sets the basic authority and structure by which CPSC is to operate.

Governing Board

The Governing Board was created by the Consultative Committee. It is responsible for the basic governance of CPSC, and consists of one representative of each participating government, with the CPSC Director and the Director of the Colombo Plan Bureau as exofficio members. The Governing Board's authority includes policy formulation, Programme development, budgeting, and staffing. Operational activities are frequently delegated to the CPSC Director, faculty and staff. A Standing Committee functions within the Governing Board to respond to urgent needs and to conduct initial explorations on matters prior to the Governing Board's official action.

CPSC Director

The CPSC Director, responsible to the Governing Board, implements policy and provides overall academic and administrative leadership of CPSC. The CPSC Director is also empowered to seek out funds, and to develop linkages with international organisations and other agencies concerned with technician education.

Academic Board

The Academic Board is given the responsibility of implementing the Governing Board's policy for programme planning and development. The Academic Board includes the CPSC Director and members of the CPSC faculty.

Panel of Advisers

The Panel of Advisers, consisting of five members from regional and non-regional member countries, provides advice and counsel to the CPSC Director and the Academic Board on substantive matters relating to technician education development in the region. The organisational structure is shown over page.

Objectives

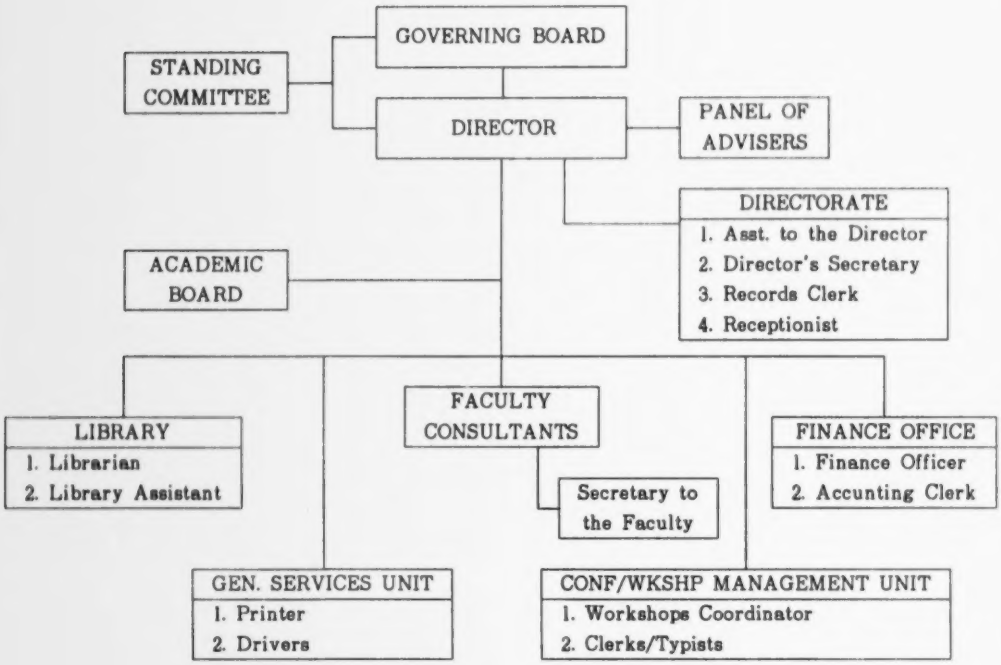
The broad statements of purposes contained in the Constitution and Rules direct CPSC : to assist the member countries of the Colombo Plan in the improvement of the quality of technician education and training in the countries of the region.

The above to be implemented in the following manner :

- To undertake programmes in staff development and training and development and research ;
- To serve as a regional forum for discussion ;
- To provide an advisory and resource service.

The original discussions leading up to the formation of CPSC referred mainly to the development of technical teacher education and training. The actual purposes provided a widened mandate to include the improvement of technician education and training. Given

ORGANISATION CHART OF CPSC



its broad mission, extensive and diverse environment, and limited and at times uncertain resources, CPSC was challenged to sort out and pursue those programmes and strategies that would maximise its impact upon technician education and training in the region.

Later statements of purposes and objectives for CPSC were increasingly programme referenced, and stated more specifically the parameters of its involvement. The current statement follows :

- To provide, both at the College and in regional member countries, courses of further professional education and training for serving technician teacher educators, key technician teachers, persons responsible for the planning, development, administration and supervision of technician education and training, and persons in key supporting roles such as training officers, librarians and registrars ;
- To conduct study conferences for directors of technical education, principals and other key personnel from education and industry, at which problems of technician education and training, including teacher education and training may be examined ;
- To assist regional countries and institutions to undertake projects in the field of staff and curriculum development and projects aimed at the effective utilisation of resources for learning and teaching ;
- To promote, co-ordinate and undertake research into the special problems of tech nician education and training within and outside the region ;
- To advise and assist member countries in developing their technician teacher education

and training facilities and in making use of other facilities for technician teacher education and training within the outside the region ; and

- To collect and disseminate information on technician education and training and technician teacher education and training.

3. Programs

CPSC conducts college-based courses, sub-regional courses, mini-courses, in-country courses, conference and seminars, project based activities, consultancy and a limited amount of research. Elaboration on each of these activities is provided below.

College-Based Courses

Fifty eight College-based courses have been conducted by the CPSC as of June 1988. These have included workshops as well as traditional style short courses. Sixteen of these programmes have been collaborative with such international organisations as UNESCO, and the Asian Development Bank(ADB).

The major thrust of these college-based courses was to create awareness of trends and innovations which were taking place in technician education both within and outside the region ; and to provide a forum for an exchange of views and sharing of experiences by key personnel. With the exception of courses undertaken collaboratively with UNESCO and the Asian Development Bank, the number of college-based courses has remained constant at three to four per year.

Sub-Regional Courses

These courses are specifically designed to address problems and issues of particular concern to a sub-regional group of countries. Such programmes have been conducted for Indian sub-continent countries as well as ASEAN countries. More are planned for a group of Pacific Island countries.

Mini-Courses

These are intended for short proactive type programmes on leading edge themes which may be of interest to member countries. They usually last three or four days and are designed to stimulate thinking on issues such as Strategic Planning, Computer Assisted Instruction and Computer Integrated Manufacturing.

In-Country Courses

CPSC operated a total of 221 in-country courses in eighteen of the member countries as of June 1988. Several countries have participated in more than seven country courses. Incountry courses have expanded rapidly during the last two to three years.

Themes for in-country courses are selected through joint consultation between CPSC faculty and regional country representatives. The courses are therefore tailor-made for specific themes. The homogeneity made possible by having participants from a single regional country allowed for greater emphasis upon skill development and application to particular problems through projects.

Conferences/seminars have been conducted by CPSC with a major emphasis on training

needs identification. Policymakers and key professionals of regional countries and visiting specialists have been invited to participate in structured programmes of one to two week duration for the purpose of identifying unmet and emergent needs of the region, such as, staff development, technical teacher training, research, and the identification of priorities for future CPSC activities.

Consultancy

Following the Consultative Committee meeting held in Jakarta in November 1980, the CPSC was given a mandate to undertake consultancy work. It was believed that such work could provide a supplementary source of funds and add to the financial stability of the College. CPSC has been successful in obtaining work on a consultancy basis, with earnings of approximately $350,000 since 1981. The type of consultancies that the CPSC has so far undertaken include :

- Design and conduct of training courses for international agencies such as ADB and UNESCO ;
- Advisory service in the setting up of a technical teacher training facility ;
- Design and management of fellowship components in a technical teacher training and technician institutions development project in regional countries.
- Advisory service in the planning of technician curriculum projects ;
- Design and conduct of a training course for the construction industry of a member country.

Assistance for Projects

Much of the in-country activity has begun to shift from traditional one-off type courses to project related workshops. When CPSC was founded there were few aided projects in technical and vocational education. At the present time almost all member countries are implementing internationally-aided projects in this area. This has created a natural climate for a shift in emphasis of CPSC's in-country activities. Several countries have embarked on a series of sequential workshops where in the inputs and outputs contribute to larger curriculum development projects.

In 1978 CPSC initiated an innovative approach to technical teacher education development when it launched a modular project for in-service teacher preparation. Self instructional modules were developed in critical areas of instructional design and delivery and introduced systematically in ten of the regional countries. This project has met with considerable success and has recently been expanded to cover the following :

- Training a nucleus of module writers in each of the participating countries ;
- Developing a series of modules on educational research methodology.

Information Collection and Dissemination

CPSC maintains a library to serve the needs of faculty, participants of the college-based courses, as well as professionals within and outside the Colombo Plan region. The library has a collection of over 7,000 books, some 130 periodicals as well as audiovisual materials consisting of slide-tape learning packages, film strips, cassette tapes, films, microfilm and microfiche, and transparencies.

As a clearinghouse for the collection, storage and dissemination of information the library has established a documentation service which produces thematic papers, country reports, syndicate reports, case studies, teaching-learning support modules, and instructional materials.

The library publishes a CPSC newsletter and library accessions lists ; booklists, and topical bibliographies which are distributed on a complimentary basis.

Research

CPSC has conducted some applied research and product development for modular training and in pedagogical training for technical teachers and the training of researchers. It has also conducted needs analysis studies and follow-up studies in relation to CPSC's overall programme.

4. Resources

CPSC's resources include faculty and staff, physical resources and funding.

Faculty and Staff

CPSC functions with a relatively small faculty which presently consists of five persons. Support staff are some twenty persons.

Regular Faculty : CPSC faculty are presently called faculty consultants. This involves two basic arrangements. Core faculty are specially recruited persons, and their salaries are paid as part of the basic operating costs. The second source of regular faculty is via government secondment with these faculty being paid by the sponsoring government.

Visiting Specialists : CPSC has added visiting specialists to its faculty expertise. Visiting specialists represent particular fields of specialisation that are required for particular courses/or project activities.

Professional and Support Staff : CPSC has maintained support staff of twenty persons to handle professional and administrative duties, clerical responsibilities, and the production of print materials.

Physical Resources

The physical resources for CPSC come from three sources. Firstly, the Philippine Government provides the location, buildings, and basic maintenance of the institution. Secondly, member countries contribute to the basic operating costs of the CPSC budget ; this includes costs associated with office materials and other expenses. And finally member governments and international agencies give voluntary contributions according to the particular needs of CPSC, and the interests of the donor.

CPSC facilities include a general office, syndicate rooms, a conference hall, a library, staff rooms, graphic and audio-visual rooms, and an exhibition room.

Funding to CPSC

Sources of funding to CPSC include member country contributions, CFTC contributions and income from specially negotiated consultancies and contracts. Some funds are formula-based, others are voluntarily given by member countries ; while income from consultancies

and contracts is in accordance with terms and conditions of respective sponsors.

CPSC's budgeting is in three categories.

One category is basic operating costs. This includes salaries of the CPSC Director ; nonteaching staff ; office expenses ; visiting staff travel and subsistence ; and faculty travel and subsistence.

A second category includes the costs of core faculty and a third category is assigned to fellowships which includes the cost of travel and subsistence for participants of collegebased courses.

Financial support to CPSC programmes, which is not a part of the institutional budget, includes the member country support for participants of in-country courses, and local government contributions to in-country projects.

There was a change in CPSC's funding pattern from the first five-year phase to the second. These differences are detailed in the sections which follow.

First Five-Year Phase Funding : The Memorandum of Understanding set forth the guidelines for funding during the first five years. It provided a two-tier formula for basic operating costs. Member countries with an annual G.N.P. of one billion U.S. dollars or more contributed a full share. Countries whose annual G.N.P. was under one billion U.S. dollars per year contributed one-half share. The Governing Board also made special provision for a few countries who contributed token amounts.

Fellowship costs during the same period were provided by countries on an individual pledge basis. CFTC also provided funds for fellowship costs.

Second Five-Year Phase Funding : The Addendum to the Memorandum of Understanding provided the basis for funding, and represented a shift from the earlier period ; it gradually increased the contributions from regional countries, and correspondingly decreased the formula funding from non-regional countries.

The formula for the basic operating costs category remined unchanged. With the onset of core faculty during the second five-year period, shared costs on a formula basis required regional countries to increase their contributions from 55.5% to 60.0% of the total costs over the five years. Similarly, non-regional countries would decrease their share from 44.5% to 40.0% of the total core faculty costs.

Fellowship costs were also placed under a formula for the second five-year period on a graduated basis. Regional country contributions would increase from 25.0% to 50.0% of the total cost of fellowships during the five years. Meanwhile, non-regional countries would decrease their contributions to fellowships from 75.0% to 50.0% during the same period.

5. Needs Determination

The College employs a two level approach to ascertaining programme needs ; first macrolevel data is collected and this is followed up with some micro level planning. The broad areas of interest which are derived at the macro level precipitate from five main sources, namely :

- a biennial consultative committee meeting ministers and senior officials
- an annual conference of senior administrators

- perceptions of faculty as a result of their regional experiences
- research studies and literature surveys
- feedback from participants to College programmes

Of the above, the major guidance as to future programmes would come from the Senior Administrators Conference. However it should be stressed that the outcome of these macro level planning strategies is usually expressed only in broad term and considerable follow up is necessary in order to articulate these ideas into firm programmes. Too heavy a reliance on feedback from clients tends to produce predominantly reactive-type programmes whereas in retrospect the clients often highly value the proactive programmes that the College has delivered, mainly through the use of mini-courses. The faculty attempt to keep abreast of the latest developments not only within the region, but also from the rest of the world. This is done by maintaining an excellent learning resource centre as well as extensive use of visiting specialists.

The follow up to the macro level planning involves the faculty visiting those countries that have suggested themes for future courses and discussing in detail with the relevant personnel the rationale, objectives, areas of study, methods, venue, timing, etc. The result of such planning visits is a complete detailing of the proposed activity. Such resultant activity could be then programmed as either College-based, country-based or sub-regional as appropriate.

The College from time to time initiates research studies aimed at identifying the major problems in the member states confronting technician education and such an exercise is currently in progress. The results of such research can result both in new areas of interest as well as innovative approaches to existing areas. These researches also facilitate TDCD (Technical Cooperation among Developing Countries) since some countries may have already solved the same problems presently facing other member states.

6. Evaluation

Whilst there is some attempt to evaluate the effectiveness of programmes delivered it has to be acknowledged that there is scope for improvment in this direction. Indeed this is true of almost all training organisations. The difficulty arises due to the practical difficulty in establishing the impact of programmes offered. The College produces for all courses offered a fairly detailed course evaluation questionnaire that all participants must respond to on completion of their course. The results of these evaluative efforts are invariably highly complimentary. This could be due to several factoprs however, which are external to the quality of the programme offered, factors such as "cultural politeness" and the enjoyment and novelty of being in a foreign country, especially all-expenses paid. Another crucial point is the fact that in a sense we are not really interested in the participants developing new knowledge, skills and attitudes, but rather in their ability to gain a multiplier effect when they return to their own settings. Thus impact studies which systematically collect data on changes in performance as a result of College programmes is the real test. Unfortunately the College has not been able to do this on a formal basis, but has collected evidence of performance changes, particularly in the area of curriculum development, which

could almost certainly be attributed to its programmes. In this regard it is probably true to say that the in-country programmes produce greater impact than the College-based programmes. This is due to a number of factors but especially due to the homogeneity of clientele, homogeniety of needs and the fact that the host government has invested considerable funds in mounting the programme.

7. Future Role of CPSC

The following table outlines a five-year programme which, in addition to continuing to meet requests from member countries for traditional programmes relating to management and curriculum for industrial development, addresses emerging needs in the wider spectrum of technician education in a phased process. This programme was introduced in 1987 and unless there is pressure from the senior administrators of the region for modifications it should continue to be implemented.

Area of Emerging Needs	1987~88	1988~89	1989~90	1990~91	1991~92
Computers in Teaching & Management	State I	Stage II	Stage III	Stage III	Stage III
Business studies	–	Stage I	Stage II	Stage III	Stage III
Medical Technician	–	Stage I	Stage II	Stage II	Stage II
Journalism/ Information Systems	–	–	–	Stage I	Stage II
Agricultural Technician	–	–	–	–	Stage I

In addition to these mainstream and largely reactive activities the College needs to focus attention on short, proactive type programmes on leading edge themes. The present Director has initiated some work in this direction and this needs furthre reinforcement. This is an area where College-based programmes could be utilised effectively.

The role of College-based programmes needs careful, critical review. Such factors as diversity of levels of technological development diversity of participants, diversity of needs and perhaps most importantly, cost, all need to be examined. There will always be a role for College-based programmes but the real emphasis should be on on-going country-based activities. The homogeneity of participants and needs, together with the cost-sharing nature of in-country activities makes them considerably more attractive. Such activities are made even more effective if the inputs are given sequentially over a period of time as part of a real on-going developmental project. Such developmental projects could be for single country or on a sub-regional basis.

The College could considerably enhance it's image, status and faculty by actively pursuing consultancy work. It is recognised that specialised expertise may be required in undertaking such work but this can invariably be bought in on a project by project basis. This has enormous potential for the Staff College since the faculty could be enriched and enlarged at no extra cost to the budget. Personnel recruited from project funds might be utilised 50% of their time on the particular project and the rest of the time contributing to the

regular tasks of the College. Furthermore, over a period of time, earnings from consultancy services may form the basis for a College Foundation which could ultimately result in the CPSC becoming self-financing.

There is an urgent need for the College to conduct some meaningful research studies. Some initiatives have already begun in this direction with the agreement in principle to appoint two College research fellows. Such research must be of practical value to the College and member countries. It is suggested that one area might be impact studies of some of CPSC's major past activities.

The College needs to promote a much closer Industry-Education interaction and sponsor occasional conferences which attempt to bridge this gap. However such ventures require strong linkage with organisations possessing the necessary technological background. An illustration of such activity is the proposal to jointly conduct with the Hong Kong Polytechnic and Korean Industry a study conference on the theme of Computer Integrated Manufacturing. The College should also act as a broker in facilitating technical cooperation among its member countries by compiling a directory of regional innovations.

Despite some of the problems and issues mentioned the CPSC remains a unique and highly valued example of cooperation between both developed and developing countries.

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Bridging the Cultural Divide : A Report on International Programs at Obirin University

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The aim of this paper is to give a brief report of how one private university in Tokyo, Obirin University, that I teach at is coping with, and adapting itself to the current emphasis on internationalization that is so much in the news in Japan today. But in order to place the International programs into a proper perspective and to show their relationship with the operations of the school as a whole, I will first have to discuss, in broad strokes, the background history of the school as well as to give a brief sketch our present situation. It is hoped that the information imparted and the ideas and topics discussed here may seve to illuminate some common issues and problems that other institutions may be facing as they try to add an international dimension to their academic programs.

1. International Programs and the Survival of the Fittest

For people familiar with the problematic situation of higher education in Japan, particularly with regards to the projections on student enrollment in the next few years, they understand that the current emphasis on international programs is not only being conducted for altruistic reasons of promoting better understanding of peoples of different cultures, or for taking care of the large numbers of foreign students who have been coming to Japan in recent years. Rather, there is a more fundamental reason involved. That of self-preservation. The projections for the number of 18-year-olds who will be seeking entry into the universities by the mid-1990s will drop dramatically. This will, of course, drastically increase the competition of students for colleges and universities. Although the more prestigious universities will easily weather such difficult times ahead, the lesser-known private colleges, in particular, will be facing a survival crisis. In this instinct for self-preservation, many of the innovative programs, which go under the name of "internationalizatvaion" is actively being pursued at this time. Thus, in the minds of university and college administrators, behind the faddishness of being "international" today (called in Japanese "kokusaika") lies a harsh reality of economic hardships ahead. This point, of decreasing students numbers, which is a real concern in the United States, have not been brought up, to my knowledge, in last year's conference at ICU.

At any rate, at Obirin University, definitely, this concern for the future welfare of the school, by being economically healthy, is one of the motivating factors behind our international programs. This cannot be denied. However, this fundamental economic concern set aside, our school has a strong tradition of internationalism. It reaches back into pre-world War Ⅱ days, and since 1946, when the school was officially founded it has been consciously pursued.

2. Japanese Higher Education : Research Problems

There is as yet no good book in English that treats the history of universities and colleges in Japan. Even in Japanese, though there are a number of "shcool histories" of particular institutions, there is no authoritative, comprehensive study, which puts the development of Japanese higher education in a broader historical perspective, and which connects it in any meaningful way with major themes and issues that characterize Japan's rise as a major industrial nation in the last century.

Because of this lack of a suitable framework within which to place my paper, I can here give only a background of our small private university, without attempting to sow its place within a broader historical context. Hopefully, in the near future, someone will come along and provide an interpretative account of the developments of Japanese higher institutions of learning. But until such a time, most of us, who attempt to write about the subject will have to limit ourselves to descriptive studies of single institutions only. The generalizations will have to wait.

3. Obirin's International Faculty

With the above limitations in mind, I turn now to describe how our small private univerity, is dealing with the question of internationalization and international cooperation. Next April we are adding a new International Faculty to our two existing faculties of Humanities and Economics. This new faculty, which took two years of preparation to put into place the curriculum and to gather suitable teachers, will get the final approval from the Ministry of Education in December.

The proposed curriculum for the International Faculty has a number of unique characteristics not found in the traditional course of study. The features were added to provide stuednts who enroll with a solid foundation for the study of different societies and their problems. Structurally, after completing the basic courses in General Education, students will choose, in their third year, a major field from the following three clusters : (1) Comparative Culture, (2) Area Studies, (3) International Relations and Communications. Within the Area Studies field, students can focus on one of three major regions : (a) the United States and Canada, (b) Japan, or (c) Asia and the Pacific Rim. All students are required to take, in their Freshman and Sophomore years, a rigorous language training program (English for Japanese students, and Japanese language for foreign students). To give students, regardless of their majors, a solid foundation upon which the educational philosophy of the International Faculty is built, introductory courses in the Freshman and Sophomore years on Comparative Culture, Methods in Area Studies, and International Relations have been made mandatory.

The projected number of students for the Intenational Faculty is set at 200. A full-time teaching staff of 40 Professors, Associate Professors, and Intructors will form the core of the new faculty. Of these 40 teaching staff, about 7 or 8 are non-Japanese, who could teach in English. Many of the other Japanese teaching staff have obtained their doctorates aboad, mainly in the United States, and are thus able to teach in English. Thus, like the International Christian University in nearby Mitaka, we too are emphasizing the aspect

of offering classes in two languages : Japanese and English.

4. International Programs at Obirin

Like many other Private and public institutions in Japan, Obirin is actively pursuing a policy of incressing our ties with similar institutions abroad ; particularly in the area of faculty and student exchanges. At the present moment, we have very active programs with some 12 colleges and universities in the United States, England, and also China. Our junior college began a student exchange program last year with a college in British Columbia, Canada. We are actively promoting this aspect of international student and faculty exchange. The working arrangements for these exchanges with regards to finances, housing, curriculum, credit changes, language training, etc., vary, with each individual institution, but I will not go into specifics on these points. More relevant to our conference topic here is our involvement with the Cooperative Japanese Business and Society Program (CJBSP). Alhough this program is not "ours," in the sense that we are directly responsible for it, because we are the host institution in Japan for it, is indeed a valuable part of our international program activities. And because this program involves issues and problems that are of common concern to all of us here, I will describe this program more below.

5. The CJBSP

The Cooperative Japanese Business and Society Program (CJBSP) is one of some 12 Cooperative Centers for Study Abroad sponsored by a consortia of North American universities and colleges. It is administered by the Council on International Educational Exchange (CIEE), the private, non-profit organization based in New York. Institutions in host countries cooperate to provide the necessary curricula support and educational experiences that individual universities and colleges in North America cannot give. At Obirin University, we are the host institution for the CJBSP.

The CJBSP was developed by the Council on International Educational Exchange as a response to the demand in North America to learn more about Japanese business. Because of Japan's rise to prominence as a world economic power, the indispensible need for having American business people familiar with Japanese ways have become painfully apparent in the last few years.

The CJBSP first started in 1982 as a seven-week intensive summer program. Since then, it has grown steadily, and now includes both a summer program as well as a semester program. The summer program is geared towards professionals who seek a highly concentrated academic program, whereas the semester program is meant mainly for undergraduate and graduate students who wish to study Japanese business and society over a longer time period. The program is open to any North American college or university student who has completed basic courses in business.* The curriculum includes an intensive Japanese language course and courses on Japanese business, politics, and economics. Students, of course, receive full credit for these courses. Each student also works on an individual project, in which he does independent research, and writes a final report. While studying at Obirin in the CJBSP program, the students live at host families near the university.

This experience, of living in a Japanese environment, is one of the most rewarding yet difficultas pects of the program. In addition to class work, students have the opportunitv to do field work, which involves in the site visits to Japanese companies, to discuss issues and problems with its officers. Past visits have included places such as Seibu Department Stores, Honda Motor Company, Yamaichi Securities, Seiko Watch Company, Keidanren, Bridgestone Corporation, Mitsubishi Bank, and many others.

Administratively, there is a Resident Director for the CJBSP whose office is on our campus. He finds homestays for the students, and is responsible for their well-being while they are in Japan. He also handles the administrative side of the program, such as hiring teachers to teach in the program, and to maintain the students' files. He acts as a liasion between the CIEE and our own university officials. To help him with his work, he has one full time secretary, as well as part-time student help. Students attend an orientation session, and at the end of the program, a four-day retreat to share their experiences with each other, and report on their individual projects. Although there are many other aspects to this program which I would like to discuss, time does not allow me to do so. But I hope the above sketchy outline of the CJBSP program gave all of you an idea of how some North American institutions are responding to the need for international cooperation, through the use organizations such as CIEE, to bridge the cultural gaps in our interdependent world.

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*Cost for the CJBSP program varies depending on different institution in the consortium. The fee was $6,570 in the spring 1987 semester. The summer program wa. $3,675 (1986). This includes tuition, housing, meals, insurance and transportation.

A Dynamic Projection for Cooperative Development

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1. Introduction

For these years, many countries have tried to make a educational reform to meet with the needs of so-called newly coming age of the 21st century. They would be based on the one hand their own recognition of the trend of change and their ambitious will to make up the higher standard of their living conditions on the basis of their own given and traditional circumstances.

Korea also was included in this trend. President's Commission for Reform of Education was organized in 1985 and the final report was presented under the title of "General Plan for Reform of Education", December, 1987.

The Commission strongly emphasized to design the cooperative setting at the internal and international level in relation to higher education. The proposal would be classified into three parts as follows ;

(1) Internal cooperation of university or university research institute.
(2) National cooperation of university and industrial world.
(3) Education for internationalization which would means the foundation of international coooperation.

The commission again pointed out the three reasons why internal or national cooperation and internationalization are needed. Firstly, the commission recognized that there have been so many and strong needs for educational effect to be achieved through cooperation, however the close mindedness of universities has hesitated to cooperate . Secondly, the real and strong needs have stimulated universities and industrial worlds to cooperate for the bringing modernization of Korean society which would be developed through improving the internal efficiency and external productivity. Here, the commission has estimated that unfortunateh they could not positively activate to meet with the needs as mentioned above. Thirdly, idealistically speaking, the commission has recognized and asserted that the more active approach might be carried out for the realization of all, international and mutual dependency in political, economic, and socio-cultural fields might be practically motivated and also the needs for international understanding, exchange and cooperation might be heightened. The commission also, in this connection with the internationalizing society, emphasized that Korea also might make every younger generation cultivate to have the internationalized mind to be much more cooperative people by the open-mindedness as a self-identified Korean and internationalized person, socially and culturally. At the same time, the commission expected that Korean younger generation also might be cultivated to meet well with others in the equal competitive motive and ability. Then, the commission suggested also that area studies, international academic exchanges or student exchanges for such a internationalization might be practically achieved.

2. Internal Cooperation

First of all, the commission particularly emphasized the internal cooperation at university level for the perspectives of much more meaningful and effective outcomes. Here, the internal ccooperation mainly means the cooperative activities of individual university each other. According to the idea of the commission, these cooperative activities are classified into three parts as follows ;

(1) Cooperation of university to university.

(2) Regional cooperation.

(3) Reinforcement of cooperation of university or university research institute

(1) Cooperation of University to University

In relation to the cooperative activities, the commission particularly emphasized that the so-called internal efficiency and external productivity might be achieved in such as following fields ;

a. Each individual university student can jointly use the class in which the other university will offer and get the credit to be accepted by the university which the student will belong. And, if it is needed, some universities can jointly offer the course for the utilization by students from the other university.

b. Universities, if it is needed, can exchange the teaching staffs and even the teaching facilities for the special experiments which would be untilized by staffs from other university.

c. Graduate schools also spread out the cooperative programs to other graduate schools and then the accreditation system would be autonomically activated.

(2) Regional Cooperation

The commission proposed to construct the regional university development committee for the following cooperation ;

a. Regional university development committee has to make individual university keep equalized developing level in quality, financial amplification for university development, cooperative activities of university and industrial world, automatic cooperative operation for university development, etc.

b. Each individual university has to try to share the special areas or departmental disciplines and, as possible, the government financially supports their activities.

c. Each regional university herself has to be a cooperative activity center for experimentations and pactices for all and at the same time each regional industrial world also jointly uses the center.

(3) Reinforcement of the Cooperative Activities between University and Research Institute

The commisson emphasized that university and university research institute might keep on close cooperative relationship in exchange of resource persons, materials, and academic intelligences as follows ;

a. University and university research institute try to keep on cooperative activities for getting financial support from government or other foundations.

b. University research institute makes university teaching staffs or students utilize the advanced facilities for the research improvement and efficiency of teaching.

c. University and university research institute might have the co-exchanging program of inviting professor or scholar.

3. National Cooperation of University and Industrial World

As many advanced countries already have experienced, the cooperative activities of university and industrial world at the national level have continued to speed up the national economic and industrial development. Therfore, in Korea also some universities and industrial worlds have tried to introduce this advanced models but now they have not well activated and generalized. However, now in Korea, they are in the strong needs for the coooperative operation between university and industrial world for the acceleration because most of the universities lack in the better facilities and research funds. Fortunately, some of indusrial worlds have ability of financial support for the mutual benefits in the long term perspectives. Then the commission particularly and strongly emphasized that the cooperation of university and industrial world might be designed and performed in such as following fields ;

(1) First of all, for the successful achievement of it, the commission asserted that an administrative setting in relation to regulation and administrative system might be set up for the fruitful effects as follows ;

a. The cooperation, in general, would be performed by the contract between academic side and industrial world. Therefore the commission proposed, for the guarantee, that some ready-made regulations which have connected with this kind of cooperation might be unified something like a "Cooperation Act for University and Industrial World."

b. For reinforcement and energetic support of cooperative activities between university and industrial world, some related organizations might be unified as a civic and governmental joint cooperative opganization such as association for university and industrial cooperation at uniersity, regional and governmental level.

(2) In relation to full achievement of cooperation, the commission recognized the professional competitiveness. And it particularly emphasized that field work and practice might be reinforced as follows ;

a. The management skill, which have provoked some irrational difficulties by the compulsory field practice system, might be removed and the other liberal incentive system in which students would autonomically select such as accreditation of academic degree, paying money as a reward and others would be operated.

b. Field work which means one of the subject-matters might be so well diversified and a part of adaptable curriculum which students themselves select the term and time should be constructed.

c. The adaptable and relevant guidelines and curriculum might be constructed at the reasonable level by the association of university and industrial world.

d. Universities or other teaching institutes might set up the system to be activated inthe

field practice.

e. Industrial world also takes charge of handling system for the idealistic performance of the practice.

(3) Development of curriculum for the cooperation between university and industrial world.

Curriculum for various programs and degree courses might be developed and managed for the efficiency of continuous or re-education at industrial world. Then cooperative education between university and industrial world will be activated as follows ;

a. Development of the circulating curriculum such as Sandwich System in England or Work-Study-Program in the States will be good models to the particular universities which are located in industrial complex.

b. Graduate school also, if it needs the field practice, might have cooperative degree courses which would be set up at industrial world..

c. University too might have the long or short term teaching program for continuous education of practical workers at university.

d. University must set up the degree course as a trust education system for the practical workers at industrial world.

(4) Flexible university admission system

The commission proposed to open the university door for the escalation of cooperation between university and industrial world. It also emphasized that the curriculum and university admission system might be flexible as follows ;

a. If university has strong need to make students have the experiences of field practices at industrial worlds, then she also has to open the door for workers who want to be regular students of the university for the mutual benefit.

b. Individual employee who worked at industrial world for a fixed term after graduation from junior college might be accepted as a student by university, if the related industrial world requests according to the contracted regulation of the trust education system.

c. Individual employee also could be a student who takes the degree work in the evening class or the class for season term system of the university. And it depends on student's selection.

(5) Reinforcement of cooperation for reseach and development

The more effiecient research and developmental design might be practically carried out between university and industrial world for the basic and applied fields of academism as follows ;

a. Industrial world might financially support for the basic and applied science research activities and it utilizes the research results both at university and industrial world.

b. The association of regional or university with industrial world jointly invest the research funds and carry out the joint research project.

c. The government also might invest the national strategical research fund and at the

same time university, university research institute and industrial world might construct the research consortia for their effective joint research activities.

d. University might positively carry out the research and developing activities at the research institute which would be financially supported by the joint mangement of university and industrial world.

(6) Active exchange of personnels or materials

For the activation of cooperation between university and industrial world, the exchange program might be more actively carried out as follow ;

a. Industrial world actively utilizes university men or other scholars as resource persons in education of workers and industrial management which would be related to supervision of practicing students.

b. University also utilizes the industrial personnels as the technical lecturers to students who take field practice course.

c. Industrial world might as well open the facilities to teaching staffs and students of university as they satisfactorily carry out their research or learning activities.

d. The association of cooperation between university and industrial world makes exchange each other various intelligences for the full performance of their works between them.

(7) Construction of supporting circumstances

The commission emphasized that university and industrial world might make the public organizations understand the importance and necessity of the cooperation between university and industrial world and positively join for the utilization of the cooperative activities as follows ;

a. The coordinating organization which will inform the successful result of the cooperative activites between university and industrial world might be center for the reports to academic kingdom.

b. The government directly and financially supports the research and developmental activities for the cooperation of university and industrial world and highly evaluate and help the superior and distinguished case of the programs.

c. The government might make the university and industrial world which well carried out the cooperative activities take the benefit of the tax reduction or exemption for fulfillment of educational and research facilities.

4. Education for Internationalization

Education for internationalization particularly means the educational foundation in interational understanding and cooperation as mentioned above. Today, internationl and mutual dependency is undergoing in connection with political, economic, socio-cultural areas. In this internationalizing society, Koreal also needs the education of internationalizing people who internationally understand and cooperate in getting along with foreigners. Here, area studies, international academic exchange are urgently needed to meet well with foreigners in the serious and competitive situation of international circumstances. The number of Korean

people who are living in overseas is increasing year by year and now the number is already over 2 million. This number is expected to be accelerated in future.

Therefore, the desirable education of them as Koreans at the actual place is urgently needed for their relevant adjustment to the actual place. Here, the commission propsed so many items to be activated in relation to internationalization and paricularly the following items might be realized.

(1) Education for international understanding

In internationalization, first of all, international understanding is the most important basis. Therefore, the commission particularly emphasized that the objective understanding of foreign situation is very important and it might be basis on the identified understanding of herself in the circumstances of international relations. Then it would be also closely connected with making foreigners understand ours. There are diversified cultures and values in international society and then these sometimes tend to bring psychological conflict and it might be as well over come through the desirable mutual communication as possible each other. In relation to this international communication, the commission also pointed out the following items to be performed.

a. Education makes Korean objectively understand her identified values. It would be carried out through teaching of Korean traditional culture, the status of Korea in international society in various fields.

b. Education of international affairs such as population, environment, human right and other international organizations which have been recognized as international common interests would be carried out through regular or extra-curricular activities, and various social education programs related to international understanding.

c. Making foreigners get correct understanding about Korea would be carried out through various Korean studies.

d. Education for international understanding might be reinforced through introduction of various kinds of information on foreign affairs such as life style, way of thinking, and visiting foregner's home, etc.

e. Foreign language teaching might be particulary reinforced through early childhood education program in long term devices, establishment of special teaching institute for foreign language learning program, something like the incubation system, intensive preservice or inservice training course for teachers and workers which they do at such as foreign language teaching center and so forth.

(2) Area studies and international academic exchange

To meet with the severe international competitive circumstances, the enthusiastic area studies are urgently needed to understand well the foreign traditions and present situations in various fields. At the same time, the international mutual dependency is also an inevitable situation and so the commission particulary emphasized that the positive international exchange in diplomatic, economic, cultural and academic field might be designed and executed as follows ;

a. First of all, the training of area specialists to be dispatched to specially designated countries and so area study courses in various fields of discipline might be established at graduate school.

b. Reinforcement of area studies might be excuted in parallel with area specialst training through establishment of independent institute for international and area studies, activities for collecting materials and analysis by the governmental support.

c. Positive activities for international academic exchanges might be performed for improvement of academic standard through exchanges of professors or students between foreign universities, inducement of international academic conference to Korea, establishment of relationshop with foreign university, establishment of sister relationship, paper contribution to foreign authorized journal, and invitation program of foreign scholars or specialists.

(3) Teaching of Korean language at the actual place

Korean people are diligent to raise up their intellectual and living standard to compete with other foreigners and then the commission emphasized that they might get the support, spiritually and administratively from mother country as follows ;

a. Korean children who are living in overseas might receive education of Korean language, culture, etc. and then Korean school or other education center has to be established at the actual place by governmental support.

b. The part-time-student-system of education such as Saturday or Sunday school programs, teaching materials might be developed and managed.

c. Corresponding education system and the materials for workers who are very difficult to get free time might be developed.

d. The quality of teachers who work at the actual place school might level up for relevant and desirable teaching Korean language, history, culture, etc. And at the same time various materials might be developed and published.

e. Education center also might be established for the teaching and other service activities.

f. Financial and administrative assistance from government and other voluntary organizations might be affirmatively received.

(4) Study abroad system

The commission recognized that study abroad system from Korea to foreign countries or from foreign countries to mother country, Korea might execute as follows ;

a. The government has to try to make superior younger generations study abroad by governmental scholarship and at the same time make also the intellectual students study abroad as many as possible. And the government has to stimulate Korean universities to have sister-relationship with foreign universities and at the same time, if it is possible, make them have the credit exchange program.

b. The government tries to provide the most desirable circumstances to Korean students who study abroad from foreign countries.

5. Remarks

The general ideas and contents related to cooperative and educational strategies in Korean higher deucation has been introduced as above and it was understood as a dynamic projection here as appeared in the title of this paper. It was interpreted as such, because the commission touched on things which wanted to be well realized. And then it would be one of the dreams because some of them will be very hard to be realized in their practical situations.

Then, it may also be understood as a dynamic but dramatic strategy which means a dream as mentioned above. In the projection, there is some lack of reality and would be interpreted as a passionate and dramatic device in which they have hurried up an approach to the desirable results. However, such device also suggested as above tends to be lack in the possibility of realization from the standpoint of practices. In other words, it will the severe difficulties in the processes of realization. Therefore, it might be objectively and concretely redesigned at the stages of realization.

The University of British Columbia and International Cooperation in Higher Education in the Asia - Pacific

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The University of British Columbia and the city of Vancouver are poised historically, geographically and attitudinally to be a major Canadian econmic, educational and cultural contact centre of linkage and cooperation with the Asian-Pacific region. In terms of land mass, Canada is the second largest country in the world next, of course, to the Soviet Union which is her neighbour in the Arctic. Vancouver, only a hundred years old, and richly multicultural in the make-up of its population, including 120,000 Chinese-Canadians, is already Canada's third largest city, after the eastern cities of Toronto and Montreal, and is the busiest seaport on the Pacific coast of North and South America. Canada Place, an instant landmark of graceful architecture built on Vancouver's waterfront for Expo 86 to serve as the Canadian Pavilion and international cruise ship facility, is now converted by the city's Trade and Convention Centre. The complex is fronted by the Pan Pacific Hotel, developed by Tokyu Canada Corporation, and houses the World Trade Centre.

Ottawa has recently named Vancouver, one of two cities, the other being Montreal, as an international banking centre—a change in financial status commensurate with the city's increased economic importance, especially with Asian-Pacific countries and their trade and investment opportunities in Canada. Li Ka-shing, of Hong Kong, was recently chosen in an international call for bids, to develop the massive former Expo 86 site of eighty-four hectares on exclusive waterfront property into a vast housing, office and commercial addition to downtown Vancouver that will be the largest example of urban redevelopment on the continent.

In yet another recent move that has direct and indirect implications for internationalism and is a signal sent across the Pacific, Ottawa has appointed David Lam, a wealthy retired businessman and generous philanthropist who immigrated to Vancouver in 1967, jobless, to the position of Lieutenant-Governor of British Columbia, the head of state for the province--the first of Chinese extraction and the first of non-Caucasian descent in Canada.

1. International Students

Universities have a large part to play in international systems ; they are more involved than ever before and very complex partnerships are being formed. The University of British Columbia is part of this trend and its involvement in internationalism has paralleled Vancouver's economic growth and potential. Admitting its first students in 1915 and located on its present peninsular site in 1925, it is the premier university of the province, the second largest in Canada (next to the University of Toronto), and one of the largest in North America with an annual enrolment of 25,000 full time students, 14,000 part-time students

and 75,000 non-degree registrants. U. B. C. 's library is the second largest in Canada and has the highest circulation rate of any research library in North America.

The University of British Columbia is one of Canada's major assets in establishing and developing contacts with the Asia-Pacific. U. B. C. President David Strangway stresses that the university is deeply committed to internationalism and the internationalization of Canadians as preparation for the "new economy" that is emerging. One of the main approaches has been the education of foreign students. The university has recommended that it make a concerted effort to increase the enrolment of international students ("Final Report," 1988) even though tuition fees are presently as high or higher than most other Canadian universities.

Currently at U. B. C., foreign students come from seventy different countries, about equal proportions come from developed countries, including especially the United States, United Kingdom, Europe and Japan, and from developing countries, where students from India and China have the highest frequency. At the undergraduate level only one percent, approximately, are foreign students. With perhaps a greater emphasis on attracting proportionally more students from the third world, it is nevertheless the provincial government's proposed goal for U. B. C. to increase the undergraduate proprtion of foreign students to a maximum of ten percent or less, possible six percent, in the future. This would ensure that to the extent that B. C. students were denied admission due to increased foreign student enrolment, there would be compensation in that a better, more enriched, quality education would be available for those that were admitted ("Opening Speech," 1987).

Present graduate levels are more respectable. Sixteen percent of Master's and twenty-eight percent of doctoral students are from other countries and it is suggested that those percentages not only be maintained but perhaps increased to as high as a desirable twenty-five to thirty percent average. This international student enrolment not only enriches the educational experiences of Canadian students but helps build the international networks of the future for further cooperation.

2. Asian Studies Centre

The U. B. C. campus already houses the country's largest vernacular collection of Asian materials, over three hundred thousand volumes in Chinese, Japanese, Korean and Indic langages. This Asain Studies Library is located in the Asian Studies Centre, opened in 1981, and built under a high pyramidal girdered roof donated by the Sanyo Corporation from its Expo 70 pavilion in Osaka. The library also houses thousands of reels of microfilm and units of microfiche as well as a basic collection of current serials and newspapers and is the national repository for Japanese government documents. Presently the Asian Studies Library is focussing its expansion on Asian language social sciences and material on business and economics in Asian-Pacific countries.

Situated next to International House and across from the Nitobe Memorial Garden, considered the most authentic Japanese garden in North America, the Asian Studies Centre provides and educational focal point for sharing trans-Pacific information and ideas. The Department of Asian Studies has thirty faculty members and enrolls approximately fourteen

hundred students in its various courses in Asian languages, literatures and civilizations.

The Asian Studies Centre also houses the U. B. C. International Liaison office of the President's Office, directed by Larry R. Sproul. This unit handles international protocol and liaison functions including exchange agreements, linkages and institutional liaison in the Asian countries. Similarly, the Institute of Asian Research is located at the Centre and it sponsors and coordinates all research on topics related to Asia, organizes workshops and coferences on Pacific Rim issues, provides liaison for Asian seminars and visiting lecturers, and publishes, five times a year, the Asia Pacific Report[1] which highlights Asian-related social, cultural, business and educational developments taking place in the Canadian community.

U. B. C. also publishes, four times a year, Pacific Affairs.[2] This journal, in its sixtieth year, has been in the vanguard exploring in depth the key issues of contemporary Asia and the Pacific and their relationship to the Western world. It provides essential background reference for business government policymakers as well as for scholars. The viewpoint is international and independent ; it has no ties to government or special interest groups ; it provides a diversity of perspectives and interpretations. The journal also features in each issue approximately fifty to sixty detailed critical reviews of current books. All the important English-language booke relevant to contmporary Asia and the Pacific are reviewed by appropriate experts in the field. No other publication in the world provides such a thorough, up-to-date overview.

3. Exchange Agreements

International activity at U. B. C. with Asia-Pacific has accelerated in recent years with the linkages with universities abroad which facilitate exchanges of students and faculty members, and the undertaking of joint research projects. Some of these linkages are formalized with agreements at the university level but others involve only a single department or faculty person and the corresponding counterpart abroad. Apart from the importance of institutional linkages, it is of critical importance that individual contacts be maintained by faculty members with their counterparts abroad and with their former international students. The collegial and alumni networks are potent relationships for facilitating economic, cultural, educational and political developments.

The following examples are signed international exchange agreements with U. B. C. (Sproul, 1988). In each case, the foreign institute of higher education contracted is followed by the date of the agreement, the U. B. C. faculty or department involoved and the type or of exchange ;

China

Beijing University	1980	Geography	Faculty & Student
Chengdu U. Science & Tech.	1983	General	Faculty & Student
Shanghai Jiao Tong U.	1983	Commerce	Faculty & Student
Zhongshan University	1983	General	Faculty
Nanjing University	1984	General	Faculty & Student
Qinghai Educ. Bureau	1985	English	Student

West Chinal Medical U.	1985	Medicine	Training Program
Beijing First Medical U.	1987	Medicine	Faculty & Student
Beijing Info. Tech. Inst.	1987	General	Faculty & Student
Beijing Normal U.	1987	General	Faculty & Student
Shanghai First Medical U.	1987	Pharmacy	Faculty & Student
Shanghai Second Med. U.	1987	Medicine	Student
Zhejiang Agricultural U.	1987	Agriculture	Faculty & Student
Beijing U. Aero. & Astro.	1988	General	Faculty & Student
East China Normal U.	1988	General	Faculty & Student
Hong Kong			
Chinese U. of Hong Kong	1985	General	Faculty
India			
Fed. of Sikh Societies	1987	General	Faculty & Student
Japan			
University of Tokyo	1978	General	Student
Tezukayama Gakuin U.	1979	General	Student
University of Tsukuba	1980	General	Student
Osaka University	1984	Law	Faculty
Osaka University	1984	Dentistry	Faculty & Student
Komazawa University	1986	General	Faculty
Nippon Dental University	1987	General	Faculty & Student
Niigata University	1988	Law	Faculty
Ritsumeikan University	1988	General	Student
Macau			
University of East Asia	1984	General	Faculty
Singapore			
National U. of Singapore	1984	General	Faculty
Thailand			
Chulalongkorn University	1985	General	Faculty
Prince of Songkla U.	1985	General	Faculty
Thammasat University	1985	General	Faculty
Chiang Mai University	1987	General	Faculty
Korea			
Sung Kyun Kwan University	1984	Physical Ed.	Faculty & Student
Kon-Kuk Uninversity	1985	General	Faculty & Student
Pusan University	1986	General	Faculty & Student
Korea Economic Res. Inst.	1987	Commerce	Faculty Research

These recent examples of exchange agreements also involve varying levels of research initiatives and potential contributions by faculty and students. U. B. C. has had a long history of encouraging primarily joint research projects－research in the true sense of the word as basically that which leads to knowledge－whether it is concerned with local issues or

international affairs, the humanities or the social sciences or the physical sciences, in the Asian Pacific region.

4. K.E.R.I. Research Agreement

The concluding agreement mentioned above with Korea in 1987 is of particular interest as an example of Canadian-Korean mutual research, in this case, in economics and trade (Moss, 1988). This cooperative venture links the two countries with the signatures of I lan Vertinsky, Director of the Centre for International Business Studies, Faculty of Commerce and Business Administration of U. B. C., and Suk-Mo Koo, Vice President of the Korea Economic Research Institute, Federation of Korean Industries, Seoul. The K. E. R. I. is the research arm of the F. K. I., the Republic of Korea's most multi-national businesses in the country.

The three-year pact provides for the mutual exchange of research ideas, experts and data. This collaborative research will put Canada and Korea in a better position to understand each other's business culture, economic structure, industry and markets and thus better determine what their respective future roles will be in the Pacific Rim market. Given that there will be increased competition of the changing market place and perhaps they can ameliorate to some extent future conflict in the area of trade by researching areas of mutual concern as well as improve their own bilateral trade exchanges.

K. E. R. I. has fifty full-time researchers and will incorporate Korean university faculty as needed and U. B. C. will also draw on faculty experts in various departments to carry out the mutual research projects. U. B. C. has suggested a number of topics for research projects proposed for the U. B. C.-K. E. R. I. collaborative study ("Agreement," 1987, p. 3). Among the proposals are : (1) Strategic analysis of bilateral relations of the two economies : Korean-Canadian relationship within a world dominated by the U. S. and Japan ; (2) Sectoral analysis of comparative advantages of Korean Japanese, Canadian and U. S. industries based on analysis of trends in productivity and input costs : electronics, autos, computers and other high-tech industries ; (3) Development of capital markets and economic growth : a comparative study of Korean and Canadian Markets ; (4) Sectoral analysis of long bilateral trade opportunities ; (5) Analysis of market penetration strategies of Korean companies in Canadian markets ; (6) Analysis of market penetration strategies of Canadian companies in Korean markets ; and (7) Analysis of direct investment and joint venture opportunities.

5. Other Research Projects

This cooperative agreement with U. B. C. and Korea is one of many research projects initiated, ongoing and completed with other countries of the Asia-Pacific on a range of topics (Sproul, 1987). The diversity of these research projects can be appreciated by such examples as : Gasification of coal with China ; Medical robotics with Japan ; Mobility of capital among Pacific Rim countries ; Effectiveness of peer programs for international students in Hong Kong ; Ground water movement, irrigation and drainage in China ; Archeaology in Japan ; Environmental impact of development in Indonesia ; Life and work of Korean monk Wohchuk ; Comparative reaction of Japan and Canada to the oil crisis of 1970s ; Land

reclamation in India ; Patterns of physical leisure activity of the elderly in Japan ; Field research in fishery sampling and monitoring in Hong Kong ; Election politics, conflict management and influence of traditional cultures in politics in Malaysia ; Current status and future direction of the liberalization of Japan's financial and capital markets ; Zoological field research on Hemiptera of Singapore ; Evolution of China/Canada postsecondary education ; Diving metabolism and physiology of pearl divers in Korea ; New religions in Japan ; Forest-tree seed physiology in Thailand ; Social and economic development in China ; Housing in Japan ; Life and work of Indian Buddhist monk-philosopher Bhararireka ; and an analysis of the ports of Yokohama and Vancouver with a comparative analysis of other port cities of the Pacific Rim. Projects might be funded by such agencies as the Canadian International Development Agency (CIDA), the International Development Research Centre (IDRC), the World Bank, or agencies of the United Nations such as UNESCO.

These selected examples of research projects indicate the diversity of the involvement of the university and is, of course, multiplies many times over by the total contribution of all other institutions of higher deucation focusing on the Asia-Pacific whether part of the Pacific Rim geographically or not. If any conclusions can be drawn from these present trends, it is that such research will continue to be of great import and will further multiply. The dissemination of the findings will expand our mutual knowledge, understanding and cooperation as does the very face-to-face interactions that necessarily take place in the carrying out of such research. Everyone benefits, directly or indirectly, by an expansion of research activities and mutual projects as knowledge increases the sophistication of our decisions and interactions.

6. Institutional Role Complexity

The responsibilities and demands on institions of higher education involved in international cooperation are intensifying and becoming increasingly complex whether traditional or innovative in approach. The education of international students, the exchange agreements, and the research projects referred to as specific examples of U. B. C.'s involvement are, as on other campuses, elaborated upon in many international ways in terms of technical and development assistance, language acquisition, training of personnel, distant learning, involvement in consortia and sister city associations, cultural events, conferences, publications, travel and study tours and other such efforts sponsored by institutions. It can be both stimulatingly challenging and enlighteningly humbling. It is interesting to note that there is a currently growing trend in an approach, especially within the developed countries, that sensitively deemphasizes "imported"students and "exported"expertise and instead encourages a more fully mutual exchange and respect (Craig, 1981).

7. Changing Global Relationships

The dramatic changes, economically and politically, that are taking place and continuing to evolve are expected to further alter the global politico-economic structure of international relationships. The annual economic summit of the "Western"industrialized world, the U. S., Japan, the U. K., West Germany and France and to which Canada and Italy have been

added with the European Community as observer, met in Toronto in June, 1988, groping for answers on the puzzling world economy. Already there are suggestions that souggestions that South Korea－the second economic engine in Asia after Japan－join the Paris-based Organization for Economic Cooperation and Development, a 24-country association closely related to the summit group of the seven major countries. Similary, senior officials acknowledged that Taiwan－may soon be observers at a future summit meeting because of their vibrant economies.

There are further signs of international flux. The economies of China and the Soviet Unon are becoming more dependent on the "West," the European Community is continuing the integration of the integration of the economies of its twelve member countries that could expand to eighteen by year 2000, A. S. E. A. N. is solidifying as a new and powerful economic block, Japan is stressing the need for trilateral economic action with Europe and the U. S., and a free trade agreement is being imminently considered between Canada and the U. S. (Some feel Canada, a minor player at the summit, could suffer a diminished role amid expected major shifts in economic clout in the years ahead and, if it does not further its economic union with the U. S., could suffer economically. Others strongly disagree with this pending apreement and argument.)

It is, nevertheless, speculated that by the next two decades, the world will likely be dominated economically by four countries－the U. S., the Soviet Union, Japan and China. The other players? Organized into geo-economic blocks? Or will we move towards a more totally interrelated multinational "global village?" Today, the key world economic issue is the redistribution of power. And the Asia-Pacific is a fundamental force. This redistribution is fundamental and will override such other important matters as Third World and national debts, internal subsidies, trade imbalances, etc., until it is satisfactorily, if not permanently, resolved.

8. Concomitant Problems

This is one scenario, and most basic ; it is of economics and power. But nature and human personalities and cultures are so complex that it is hard not to expect other variables to intervene, expectedly and unexpectedly, and to have ramifications on any outcome. Environmental issues of industrial pollution, climatic change, A. I. D. S., depletion of natural resources, world hunger, population explosion, poverty, human rights, drug abuse, unemployment, crime, racial prejudice, nationalism, militarism, terrorism, and the imbalanced distribution of wealth within nations and between nations for example, are societal problems that will contribute as factors in some interactive capacity to the equation that will determine the outcome of our futures.

The dilemmas have not been resolved presently and it is a quantum leap in faith that they will be easily and quickly resolved in the future. Racial prejudice and nationalism are still deeply imbedded emotional attitudes in the socio-psychological makeup of most people.

9. Racism and Nationalism

In British Columbia, a province that prides itself on its newness, beauty, quality of life,

space, tolerance and multiculturism, signs of prejudice are becoming overt as a reaction to the changing times. Canada's "insane," too openly liberal, immigration policy is being attacked for not stopping the "Asian Invasion." And the significantly increased influx of investment capital is being criticized for beginning to turn Vancouver into "Van Kong." Such reactions, sociologically, are to be expected during periods of social readjustment. but they might portend further social tensions.

B. C. is not alone in this racist undercurrent. It is a universal condition in some form or another. The Japanese public, for example, during the recent decade, has shown increasing "gai-jin-phobia" (dislike of foreigners) attributed to various factors, including A. I. D. S. Similarly, polls have shown increasing nationalism and parochialism among the public. This shift in the collective psyche which has produced the current neo-nationalist mood seemingly springs from Japan's phenomenal economic prosperity and concomitant self-confidence, and superiority. (Although understatement has always been a Japanese tradition, the cost of living and quality of life have led some critical citizens to question the significance of their economic prosperity.)

Nevertheless, Shuichi Kato (1987), a Tokyo literary critic, writing in Asahi Shimbun, a leading Japanes daily paper, is concerned about the neo-nationalism and the persistent debate among the intelligentsia about redefining "Nihin-jin-ron" (the cultural identity of the Japanese) : "Whether Japan's current neo-nationalist mood remains benign or turns malignant depends largely on how far we internationalize our society. if we open our minds to the outside world as wel as our markets, today's over-weening sense of achievement will probably not harden into a destructive chauvanism. But should a backlash against U. S. and European trade pressures fuel the new patriotism, we are in for trouble, particulary if a recession becomes a protracted economic crisis. The spectacle of a fanatical Japan is not pleasant to contemplate."

10. The Challenge of Cooperation

The nations of the Asian-Pacific that have increased their share of the world's economy are now important participants in the international market place. Dearing (1988) asks will increasing economic interaction be accompanied by increasing hostility? He agrees with the suggestion of most researchers that we are at the dawn of a Pacific Age, but worries that Pacific dominace is being truncated, becoming factionalized, and that we could witness a twilight of unity among nations that border the Pacific. The japanese-U. S. econo-political relationship, including that as transmitted through the mass media, is the vital factor that may sever the unity of the Pacific Rim if not developed with deliberate bilateral effort. With cooperation and goodwill this very same international relationship means the Pacific region could hold together and continue to evolve socio-economically within a framework of mutual respect and interrelatedness.

It is the challenge of institutions of higher deucation, the universities and their "universal" outlook, to further internationalism, generally and specifically, at every opportunity in ord r to encourge the cooperative spirit within a healthy competitive system that brings out the best in individuals and societies. The conflict of values inherent in such a stance will demand

from us our utmost intelligence, sophistication, wisdom and faith. We need to continue our international efforts, extend them, and be open to all new opportunities. We need to prepare our citizens to adjust to life in an interconnected global system. We need to retain our idealism and our pragmatism. Another conflict of values. But the ability to compromise often means the ability to cooperate. In the end, at the most fundamental level, this cooperativeness is basic to the spirit of internationalism in all its soaring potentiality

11. Footnotes

1. Editor, Asia Pacific Reports, Institute of Asian Research, 1871 West Mall, University of British Columbia, Vancouver, B. C., Canada V6T 1W5. (Annual subscription rate is $ 10.00 Canadian.)

2. Pacific Affairs, 2029 West Mall, University of British Columbia, Vancouver, B. C., Canada V6T 1W5. (Annual subscription rate is $ 25.00 or for 2 years, $ 40.000 Canadian ; outside Canada add $ 5.00 and add $ 10.00, respectively, for handling postage.)

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The Higher Education Research Agenda for Teaching and Learning in Multicultural Settings : A Delphi Questionnaire

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At the PHAHE conference in Tokyo, August 18~20, 1987, a self selected group of twenty-two researchers and teachers met to generate a number of research questions which could become the basis of a questionnaire to be used to converge the opinions of a broad number of educational researchers. The PRAHE conference presented an opportunity to meet with a large number of researchers and other professors, gathered in one location. This questionnaire, based on the questions developed at the 1987 conference, is being presented as a preliminary trial of that Delphi instrument.

The questions formulated, written and discussed in last year's forum have been summarized and categorized and placed in the format of a delphi questionnaire. This will allow presentation of these questions to a broader sample of experts in fields such as educational research, multicultural education, cross-cultural psychology, and anthropology. The purpose of this presentation is to get a last refinement of the questions before the instrument is field tested. With feedback from a sample of international scholars and researchers it is anticipated that improvement of the questionnaire can be achieved prior to utilizing it as an actual research tool

1. Evaluation Criteria

Each page of the questionnaire contains a number of rating scales designed to focus the respondents' attention to a range of criteria for evaluating significant aspects of the research questions. The criteria deal with problem size, importance to institution/society, level of concern, timeline of concern, and overall priority are the areas of rating on which this study will collect and analyze data.

The specific criteria* are as follows :

Magnitude : A rating of whether the problem is large or small.

Centrality : A rating of whether the research question is important or unimportant to my society or institution.

Influence : Are the impacts many or few ?

Relevance : Is this research question appropriate or inappropriate for my society or organization to study ?

Focus : At what level will this research question have the greatest significance ? National, state/provincial, regional, or local community level.

Timing : This research question will be of greatest concern within 1~3, 4~6, 7~10

years.

*These criteria were adopted from a delphi study conducted by the Agency for Instructional Television, an American-Canadian organization located in Bloomington, Indiana, U.S.A.

2. Delphi Study Procedures

The study will be conducted by having the repondent experts answer two rounds of the questionnaire. On the first round the respondents will be asked to answer in the questionnaire using their best information and intuition. The round one responses will be tabulated and a statistical analysis of the frequencies, means, and standard deviations for each of the variables of the twelve questions will be calculated. Percentages indicating the high and low overall rankings will be shown.

In round two the intent will be to encourage each respondent to consider the information collected in round one to see if the new information gives them a different perspective of the importance of the various research questions. It is usual for responses in round two to move toward a higher degree of consensus due to the availability of information from round one responses. A second reason for a shift toward more consensus is that the respondents of round two are asked to justify any responses falling more than one standard deviation from the mean. When the responses from round two are returned, the data will be tabulated and the final analyses and report completed.

On the following page is a draft copy of the questionnaire. Please examine the copy and make any suggestions you may have for improving it. If you return the copy with suggestions to the presenters, they will send you an updated draft by mail. Please be sure to put your name and address on the copy.

DELPHI QUESTIONNAIRE

INSTRUCTIONS

Please indicate your opinion on the importance of each of the questions which follow. Your thoughtful response will be appreciated and will take approximately 20 minutes.

It is suggested that you read the "research question" first, then read the "clarifying" or related questions. If necessary, re-read the questions again and then rate your opinion of the value of the research suggested in the question. Please add comments which you feel will further define the research area being suggested and which will give others a better understanding of the importance, or lack thereof, of the research topics being rated.

You are not being asked to answer the research question. You are instead being asked to give your expert opinion of the value you place on having this research question studied.

After having answered the 12 questions in the instrument, please answer the 2 questions below ; place your name and address in the space provided, and mail to the address shown.

Question #1 : What are the three questions of highest priority ? _____, _____, _____.

Question #2 : What are the three questions of lowest priority ? _____, _____, _____.

Name _____

Institution _____

Address _____

Please mail to :
Sheldon Varney
Dept. of EA, WA 2-227

1776 University Ave.
Honolulu, HI 96822

DELPHI SURVEY

Research Question 1 : —comments—

What is the effect of prejudice and ethnocentrism on the learning achievement of studnets of both the host and sojourning cultures?

Clarifying Statements :

What are the effects host prejudice and ethnocentrism on host student learning achivement? What is the effect of host P. & E. on both host and sojourner learning? What are the effects of returning students on their home culture? Do some cultures gain more from their returning sojourner students than other cultures do? Why? What conflict experiences exist in these various intercultural exchange? Are any of these effects beneficial?.

Evaluative Criteria :

1.	Large problem	1	2	3	4	5	Small Problem
2.	Important for my institution's function	1	2	3	4	5	Not important for my institution's function
3.	Impacts many	1	2	3	4	5	Impacts few
4.	Appropriate for this project to study	1	2	3	4	5	Not appropriate for this project to study

5. Of greatest concern at : (check as many as necessary)
   _____ national government level
   _____ state/provincial level
   _____ regional level
   _____ local level
   _____ other level : please specify _____
6. Of greatest concern within : (Please circle one)
   (1~3 years) (4~6 years) (7~10 years)

DELPHI SURVEY

Research Question 2 : —comments—

What do we actually believe about one another's culture?

Clarifying Statements :

To be successful in educating students in multicultural settings, educators must begin with an understanding of the basic concepts of intercultural interaction and indeed culture itself. What is the source of such beliefs? Are the beliefs accurate? How can the accuracy of intercultural beliefs be verified? Are some cultures more likely than others to have the ability to make accurate attributions about another culture? What causes intercultural disputes and misunderstandings?

Evaluative Criteria :

1.	Large problem	1	2	3	4	5	Small Problem

2. Important for my institution's function	1	2	3	4	5	Not important for my institution's function
3. Impacts many	1	2	3	4	5	Impacts few
4. Appropriate for this project to study	1	2	3	4	5	Not appropriate for this project to study

5. Of greatest concern at : (check as many as necessary)
   _____ national government level
   _____ state/provincial level
   _____ regional level
   _____ local level
   _____ other level : please specify _____
6. Of greatest concern within : (Please circle one)
   (1~3 years) (4~6 years) (7~10 years)

DELPHI SURVEY

Research Question 3 : —comments—

Is it necessary to understand the language of a culture to be able to successfully function in that culture ?

Clarifying Statements :

The notion is sometimes stated that it is necessary to be able to think in a language to be able to understand the people who speak that language. Is culture and language actually so interdependent ? Are there other means of communicating in non-verbal ways that would facilitate successful functioning ?

Evaluative Criteria :

1. Large problem	1	2	3	4	5	Small Problem
2. Important for my institution's function	1	2	3	4	5	Not important for my institution's function
3. Impacts many	1	2	3	4	5	Impacts few
4. Appropriate for this project to study	1	2	3	4	5	Not appropriate for this project to study

5. Of greatest concern at : (check as many as necessary)
   _____ national government level
   _____ state/provincial level
   _____ regional level
   _____ local level
   _____ other level : please specify _____
6. Of greatest concern within : (Please circle one)
   (1~3 years) (4~6 years) (7~10 years)

DELPHI SURVEY

Research Question 4 : —comments—

Is there a relationship between one's culture and one's style of learning ?

Clarifying Statements :

Do learning styles vary culture to culture? Are certain learning styles better suited to students from certain cultures? Which is more flexible, learning style or teaching style? Do students have more than one learning style that is not significantly different than the others? Do teachers have a range of teaching styles that are not significantly different from one another?

Evaluative Criteria :

1. Large problem	1	2	3	4	5	Small Problem
2. Important for my institution's function	1	2	3	4	5	Not important for my institution's function
3. Impacts many	1	2	3	4	5	Impacts few
4. Appropriate for this project to study	1	2	3	4	5	Not appropriate for this project to study

5. Of greatest concern at : (check as many as necessary)
   _____ national government level
   _____ state/provincial level
   _____ regional level
   _____ local level
   _____ other level : please specify _____
6. Of greatest concern within : (Please circle one)
   (1~3 years) (4~6 years) (7~10 years)

DELPHI SURVEY

Research Question 5 : —comments—

Does the study of foreign cultures have a measurable impact on students?

Clarifying Statements :

If there are impacts, in what areas do these impacts occur? For example, are there impacts on student adjustment? On prejudices? On disputes? On success in foreign assignment? On faulty attributions? On readiness for developmental tasks(in elementary school)? On satisfaction in interaction with people from other cultures? Others?

Evaluative Criteria :

1. Large problem	1	2	3	4	5	Small Problem
2. Important for my institution's function	1	2	3	4	5	Not important for my institution's function
3. Impacts many	1	2	3	4	5	Impacts few
4. Appropriate for this project to study	1	2	3	4	5	Not appropriate for this project to study

5. Of greatest concern at : (check as many as necessary)
   _____ national government level
   _____ state/provincial level
   _____ regional level

_____ local level

_____ other level : please specify _____

6. Of greatest concern within : (Please circle one)

(1~3 years) (4~6 years) (7~10 years)

DELPHI SURVEY

Research Question 6 : —comments—

Does the use of diverse instructional technology have an effect on learning in multicultural settings ?

Clarifying Statements :

In the twentieth century, technological innovations related to instruction have come to the forefront. Yet much of the potential for using instructional technology has remained untapped. Can technology such as interactive T.V. and computers, to mention two, enrich the effectiveness of education in multicultural settings ?

Evaluative Criteria :

1. Large problem	1	2	3	4	5	Small Problem
2. Important for my institution's function	1	2	3	4	5	Not important for my institution's function
3. Impacts many	1	2	3	4	5	Impacts few
4. Appropriate for this project to study	1	2	3	4	5	Not appropriate for this project to study

5. Of greatest concern at : (check as many as necessary)

_____ national government level

_____ state/provincial level

_____ regional level

_____ local level

_____ other level : please specify _____

6. Of greatest concern within : (Please circle one)

(1~3 years) (4~6 years) (7~10 years)

DELPHI SURVEY

Research Question 7 : —comments—

In the field of the development of programs in multicultural settings, what program development methods and techniques are most effective ?

Clarifying Statements :

How is resistance to change from faculty, students, and administrators alleviated ? Does the type of change resistance differ from culture to culture ? Do successful program development and change strategies differ from culture to culture ? Should foreign internship programs for university professors be established ?

Evaluative Criteria :

1. Large problem	1	2	3	4	5	Small Problem
2. Important for my						Not important for my

	institution's function	1	2	3	4	5	institution's function
3.	Impacts many	1	2	3	4	5	Impacts few
4.	Appropriate for this project to study	1	2	3	4	5	Not appropriate for this project to study

5. Of greatest concern at : (check as many as necessary)
   _____ national government level
   _____ state/provincial level
   _____ regional level
   _____ local level
   _____ other level : please specify _____
6. Of greatest concern within : (Please circle one)
   (1~3 years) (4~6 years) (7~10 years)

DELPHI SURVEY

Research Question 8 : —comments—

What are the positive and negative effects of student exchange programs on students?

Clarifying Statements :

Students who study abroad have both positive and negative experiences and often a combination of both. What is the impact of these experiences to their future modes of thinking? On their future career choices? On their country of origin?

Evaluative Criteria :

1.	Large problem	1	2	3	4	5	Small Problem
2.	Important for my institution's function	1	2	3	4	5	Not important for my institution's function
3.	Impacts many	1	2	3	4	5	Impacts few
4.	Appropriate for this project to study	1	2	3	4	5	Not appropriate for this project to study

5. Of greatest concern at : (check as many as necessary)
   _____ national government level
   _____ state/provincial level
   _____ regional level
   _____ local level
   _____ other level : please specify _____
6. Of greatest concern within : (Please circle one)
   (1~3 years) (4~6 years) (7~10 years)

DELPHI SURVEY

Research Question 9 : —comments—

Do students learn better in monocultural or multicultural settings?

Clarifying Statements :

This is a cultural restatement of the homogeneous/heterogeneous grouping problem. Does the mixing of students from different cultures have a measurable effect on student learning?

Evaluative Criteria :

1. Large problem	1	2	3	4	5	Small Problem
2. Important for my institution's function	1	2	3	4	5	Not important for my institution's function
3. Impacts many	1	2	3	4	5	Impacts few
4. Appropriate for this project to study	1	2	3	4	5	Not appropriate for this project to study

5. Of greatest concern at : (check as many as necessary)
   _____ national government level
   _____ state/provincial level
   _____ regional level
   _____ local level
   _____ other level : please specify _____
6. Of greatest concern within : (Please circle one)
   (1~3 years) (4~6 years) (7~10 years)

DELPHI SURVEY

Research Question 10 : —comments—

Will matching teaching styles to learning styles result in improved student achievement?

Clarifying Statements :

Do teaching styles vary from culture to culture? Is teaching style a determinant of student achievement? Can a "one best" teaching style be found which is more effective for students of a selected culture than for those of other? Is it more effective to adapt the student to the teacher's style or vice versa?

Evaluative Criteria :

1. Large problem	1	2	3	4	5	Small Problem
2. Important for my institution's function	1	2	3	4	5	Not important for my institution's function
3. Impacts many	1	2	3	4	5	Impacts few
4. Appropriate for this project to study	1	2	3	4	5	Not appropriate for this project to study

5. Of greatest concern at : (check as many as necessary)
   _____ national government level
   _____ state/provincial level
   _____ regional level
   _____ local level
   _____ other level : please specify _____
6. Of greatest concern within : (Please circle one)

(1~3 years) (4~6 years) (7~10 years)

DELPHI SURVEY

Research Question 11 : —comments—

Is there a relationship between instructional organization patterns at either the classroom, program, or institution levels and the effectiveness of educational programs in multicultural settings?

Clarifying Statements :

Does the small group versus the large group instructional patterns have an effect on the learning achievement of students from different cultures? Is there a difference between the ratio of in-class/lecture time to independent study/library research time which is more effective for students from one culture than another? Are experienced-based programs more effective for students of some cultures than for others? Are interdisciplinary programs or single discipline programs more effective for students in a heterocultural learning group? Is it more effective for a university to recruit a large number of students from one or two countries or to recruit smaller numbers of students from many countries?

Evaluative Criteria :

1. Large problem	1	2	3	4	5	Small Problem
2. Important for my institution's function	1	2	3	4	5	Not important for my institution's function
3. Impacts many	1	2	3	4	5	Impacts few
4. Appropriate for this project to study	1	2	3	4	5	Not appropriate for this project to study

5. Of greatest concern at : (check as many as necessary)
   _____ national government level
   _____ state/provincial level
   _____ regional level
   _____ local level
   _____ other level : please specify _____
6. Of greatest concern within : (Please circle one)
   (1~3 years) (4~6 years) (7~10 years)

DELPHI SURVEY

Research Question 12 : —comments—

Is there a relationship between the type and quality of the multicultural programs /policies of a nation's universities and the effectiveness of that nation's international relations?

Clarifying Statements :

Are nations with parochial points of view and policies more effective internationally than nations holding broader points of view? Do the multicultural programs of some nations seem to be more effective than those of other nations? Do the

multicultural programs of a nation's universities seem to be related to that nation's economic success? ···To that nation's international conflict resolution effectiveness?

Evaluative Criteria :

1.	Large problem	1	2	3	4	5	Small Problem
2.	Important for my institution's function	1	2	3	4	5	Not important for my institution's function
3.	Impacts many	1	2	3	4	5	Impacts few
4.	Appropriate for this project to study	1	2	3	4	5	Not appropriate for this project to study

5. Of greatest concern at : (check as many as necessary)
   _____ national government level
   _____ state/provincial level
   _____ regional level
   _____ local level
   _____ other level : please specify _____
6. Of greatest concern within : (Please circle one)
   (1~3 years) (4~6 years) (7~10 years)

Academic Linking : The British Council's Role in International Cooperation in Higher Education

David Rogers
Representative of British Council, Seoul, Korea

One of the things one learns quickly as an international bureaucrat dealing frequently with universities and other institutions of higher education is that of all the world's great professions university academic staff are the least constrained by national boundaries. The pursuit of knowledge produces its own frontiers but in that pursuit academics are criss-crossing national boundaries all the time. I am quite sure that if academics stopped travelling, some airlines would go out of business.

As a student of English literature I cannot resist sharing with you the prologue to a novel "Small World" by one of Britain's most amusing novelists of university life, David Lodge. He reminds us of the opening to the 14th century poem "Canterbury Tales" by Geoffrey Chaucer. In this the poet notes how when the summer comes man feels the urge to travel. Fourteenth century man went on pilgrimages. These days, says David Lodge, professional people call them conferences.

"The modern conference," he writes, "resembles the pilgrimage of medieval Christendom in that it allows the participants to indulge themselves in all the pleasures and diversions of travel while appearing to be seriously bent on self-improvement. To be sure, there are certain penitential exercises to be performed-the presentation of a paper, perhaps, and certainly listening to the papers of others. But with this excuse you journey to new and interesting places, meet new and interesting people, and form new and interesting relationships with them ; exchange gossip and confidences(for your old stories are fresh to them, and vice versa) ; eat, drink and make merrry in their company every evening ; and yet, at the end of it all, return home with an enhanced reputation for seriousness of mind."

I am afraid it wil not enhance my own reputation for seriousness of mind to say that the British Council, for which I work, is one of the world's great academic travel agencies. But with operations in over 80 countries and offices in over 120 cities, it must be true. What is also true is that to this travel there is a very serious underlying purpose. With academic exchanges, as with all its people-to-people-programmes in educational, scientific and cultural fields, the British Council aims to promote international understanding and to assist more balanced economic development across the world without which international stability is fragile. The discipline-based interests of academics and professionals of all nations transcend country boundries and can constitute a moderating influence in a world of competing national loyalties.

In Britain, international cooperation in higher education is coordinated by a committee of university and college presidents which is serviced by the British Council. The committee, which has a global brief, is selected by the Inter-University and Polytechnic Council(IUPC) a body representing the interests of all higher education institutions in Britain. The

committee steers and oversees a wide range of programmes with other countries, but in this paper I want look at just one of the successful mechanism-the creation of formal academic links between a British and a foreign institution.

These academic links are not to be confused with sister relationships of the kind that were popular in the past between institutions in Korea and the USA. I am sure that some of these sister relationships have been successful but too often they were agreements only on paper. In practice, little joint activity took place after the initial flurry of interest leading to the signing of a very broad agreement, which tended to be strong on sentiment but weak on specifics.

The academic link for which the British Council aims in often limited to cooperation at the departmental level where some specific common interest has been idnetified between the two institutioins. We begin if you like from the bottom and work up rather than vice versa. We appreciate the importance of securing the interest and support of the university president, but we are suspicious of an initiative that is all top and no bottom.

Whether the link is between universities or between departments it must have one or more definable purposes or objectives, a time scale in which to achieve them and regular monitoring of progress. Its success depends on the development of good understanding between the partners and a genuine mutuality of benefit.

There are a number of purposes for which links can be developed. I will mention those to which our experience suggests links have a particularly valuable contribution to make.

1. Institutional Development

A fine example of this is the link between the University of Loughborough and what is now the University of Ulsan, whose founder President, Dr Lee Kwan, is now Minister of Science and Technology. Established in 1971 as an Institute of Technology with aid funds from the British Government, Ulsan's link with Loughborough was its principal source of foreign expertise.

2. Staff Development

The creation of an appropriately qualified local cadre of staff-academic, administrative, library and technical-is a clear aim of institutions in developing countries. Most links in some way will assist this process of educating and broadening the perceptions of staff in the developing country department, but some have been conceived with this as a principal and specific objective.

3. Institutional Management

The importance of sound institutional management is relfected in co-operative arrangements between institutional administrative units. Again, the use of links in one means of ensuring that administrative staff have opportunities for developing their professional skills and for introducing new administrative systems. Our experience suggests that links between administrative units are likely to be most successful when they are directed towards a specific purpose.

4. Training Technical Staff

For an institution to carry out its function effectively there must be an adequate infrastructure. Laboratories, workships and libraries play a vital role. There must be adequate funding both for the provision of facilities and for their maintenance. The last decade has seen heightened pressure on the use of these resources in most institutions. Increasingly, highly sophisticated equipment is being commissioned. There is a heavy demand for the training in Britain of technicians who require experience of particular techniques of equipment. Visits by experienced British technicians to an overseas institution can be very useful both for maintencace, repair and recommissioning of equipment, and for training local technicians on the spot. The use of inter-departmental links is one way in which this training of technicians and of specialized library staff can be achieved.

5. Course and Curriculum Development

An institution whose goal is the production of skilled manpower attuned to national needs must ensure that its curricula are relevant. Curriculum development is a continuous process. In the search for a relevant curriculum-as with teaching methodology-much can be gained from a co-operative approach. It must be for the institution itself to determine the subjects it offers and their orientation, but detached, experienced, outsiders can offer valuable perspectives if they are sensitive to local circumstances.

Refresher courses for staff outside their own institutions and in-service training are important to ensure that staff are kept aware of developments in their subject areas. This is especially important in those science and technology disciplines where the pace of change is especially fast.

6. Technology Transfer

The application of science and technology to the solution of local problems is a further area in which links form part of the package of instruments available for assistance. Transfer of technology will be a main objective of many links. Care is needed, however, to ensure that the technology chosen is appropriate.

7. Research Collaboration

Academic institutions must contribute to national development through research, both by providing a focus and testing ground for training, and by seeking solutions to long term national or regional problems. It must be for the overseas governments and institutions themselves to determine research areas in the light of national development plans. Nevertheless, links have a role to play, both directly (through collaborative research) and indirectly (by strengthening provision of staff resources and institutional infrastructure). A link which is focussed on collaborative research will expose a significant number of staff from both sides to the strengths of the other institution. Such a research programme can provide opportunities for field experience for a British researcher who might otherwise find it difficult to obtain individual suport for a longer term research attachment overseas. It can allow the overseas researcher access to British facilities not available at home. The

collaboration may be quite an informal one or it may be a formal arrangement with a specific objective, for example, joint publication.

The last three years in Korea have seen a remarkable growth of interest in formal links with British universities. In 1985 there were only 3 active links, now there are 20 with a further 6 or 7 in the pipeline. Elsewhere in the Pacific Region, the biggest programme is in mainland Chaina with over 100 links and a short-term target of 150. There are 15 in Malaysia, 6 each in the Philippine and Indonesia and 1 each Singapore and Papua New Guinea. There will of course be additional links in each of those countries which are not in recept funds from offical British sources. Japan has an extensive programme of cooperation with British universities in science. Worldwide the total of British Council supported links is approaching 300.

Links can start in a variety of ways including for example :

- Personal contacts leading to the discovery of a shared interest which can be usefully developed through a link.
- A need for access to specific laboratory facilities or to field work, which requires collaboration with another institution.
- A wish to draw upon the experience of another institution for the development of a new course, or the establishment of a postgraduate course or the development of administrative, library or technical services.
- A wish to formalise or extend an existing relationship
- As a means of meeting a specific need included in a British financed aid package to an overseas institution.

In a recent survey of 21 new links in China, we found that about half occured following a visit to China by a British academic, and 3 from an invitation by a Chinese institution following a successful Ph. D. programme carried out in the UK by one of their staff members. Four of the links began as consequence of a visit by a Chinese academic to the British university and four others arose from the recognition of mutual research interest either by correspondence or by a personal meeting at a conference. One link was the result of an initiative by the Chinese Embassy in London. Another is reported to have originated in a proposal conveyed to the British institution by a Chinese postgraduate student already attending another institution in Britain.

What precisely then is the role of the British Council? The British Council has executive responsibility for all programmes approved by the national committee and institutions looking for support should therefore begin by approaching the Council. In Britain the approach should be to the Council's Higher Education Division ; overseas it should be to the British Council Representative.

The British Council often becomes involved in discussing support for a link only after the partners have identified a mutual interest, but it can also help overseas departments identify a British institution which may be able to respond to a particular need. Its role essentially is that of the facilitator. Once the interest has been established, the British Council can provide funds for a visit in one or other direction to enable discussions on proposals to take place. Once the prospective partners have reached an understanding, a

link agreement, or project plan should be produced. This should state clearly the objectives of the link and time scale within which the objectives should be achieved. It should identify the various elements or components of a link. and provide a schedule of proposed activities on an annual basis, with costings when possible.

On receipt of the agreement, the British Council will identify those elements or components which it can support and it will cost these, thus determining the finance required each year during the life of the link. It is possible that there will be some activities whose support will be more appropriately provided from outside sourced. The British Council may be able to help the partners identify these.

Once the link is established each partner should nominate a principle collaborator or co-ordinator. The co-ordinators may correspond either directly, keeping the British Council informed, or through the British Council.

As Britain's principle agent for educational, scientific and cultural exchange with other countries, the British Council can support academic links with funds from its other exchange programmes. In Korea, we have redirected about 60% of our funds for British Council scholarships for the exclusive use of Korean universites wishing to send staff or researchers on longer term study at their patner institutions in UK. Our book presentation programme is also now exclusively for linked instituitions in Korea.

It must be clear from this that the British Council is a very unusual travel agency. It contributes itself to the cost of travel. It is important however to stress that the fundes at the British Council's disposal are to facilitate rather than to fully fund activity. We expect parallel funding from other sources from the outset of the link. Typically we would provide the international airfares for British academics visiting Korea, but would expect the Korean partner institution to meet all costs in Korea. For Koreans travelling to Britain we and the British institution would expect to be able to meet costs in Britain, but would look to the Korean institution to porvide international airfares, although a contribution could be made to these of the stay in Britain was very short. This multiple funding is highly desirable both in view of the limited resources available to the British Council for this work, and more importantly, for the real commitment that it requires from the link partners. It is also our hope that the existence of a link could be instrumental in allowing partners to attract funding from other sources to extend activity or sustain it over longer period. In this sense British Council funds can be seen as pump-priming, stimulating the establishment of enduring relationships between departments and institutions.

Earlier in this paper I stressed the importance of regular monitoring of progress towards the agreed objectives. Most of our projects in Korea are at too early a stage for evaluation, but a recent survey of projects in China found evidence of widespread benefits. In many cases specific research objectives had been achieved and confirmed by published work. There had been new insights into teaching methods, mastery of new experimental techniques, education in computer applications, a general broadening of educational experience. Success in promoting student flows in either direction is also easily quantifiable. However the broader aspects of promoting mutual understanding and enhancement of cultural realtions between the two countries cannot so easily be assessed.

The factors identified in the survey as being most important for success were :

- The dedication and enthusiasm of the staff concerned-and some breadth of staff support so that the link does not depend on one or two individuals. Nevertheless a few links have thrived on the basis of a single keen and gifted individual.
- A clear statement of objectives at the outset and clear understanding between the partners of what is expected.
- A good matching of the academic interests of the two sides and a good balance of academic standards. The particular subject to the link may be a single large project and a range of common interests is very helpful.
- Institutional willingness to support the link if necessary with resources, usually at a modest level, to enable research to be pursued or for other purposes.
- The development of stimulating ideas for the continuance of the link after the initial funding period.
- The availability of data or techniques to which access would not otherwise be readily achieved.

The pace and the cost of meeting fresh challenges in higher education are such that, even in the most favourable circumstances, it is not easy to build up a self-sustaining group of scholars, teachers and researchers to work effectively in a range of disciplines. I know that I am preaching to the converted when I say that , in such a difficult environment, academic links and other forms of international educational cooperation will play an even more vital part than higher to in maintaining universities and polytechnics as the path finders for intellectual and material progress. The British Council has found that its own brand of link-bottom up, objectives oriented, joint activity, parallel funded-is an effective way of creating the conditions in which scholars from different countries can work together in useful ways.

Problems and Tasks of International Cooperation at University of Tsukuba

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1. Introduction

(1) Generally speaking, there have been two types of universities ; one is international in character, and the other is national. In case of Japan, the Imperial Universities were the ones which especially had the characteristics of the latter type, and were locked up in "Ivory Tower".

At present, Japanese universities have taken the path of internationalization. They have lost the traits of the "Ivory Tower", and have come to surge on the wave of "Research Collaboration with Industry and Government", as well as international co-operation.

University of Tsukuba, founded in 1973 as the pilot institution of the Japanese new universities, places strong emphasis on the international co-operation(exchange) programs both in the field of research and in teaching. Moreover, University of Tsukuba aims to promote the research collaboration. It is now preparing the establishment of "Research Collaboration Center".

(2) Almost all Japanese universities would not conduct their own self-evaluation. However, University of Tsukuba did publish its "Self-Evaluation" in a report entitled "Self-evaluation and Reform Tasks at University of Tsukuba" in 1988.

In this paper, I would like to talk about "Problems and Tasks of International Co-operation at University of Tsukuba" based on the viewpoint of this report.

University of Tsukuba's international activities can be grouped into three categories ; (1) Exchange of Students, (2) Exchange of Teaching Staff and Researchers, as well as (3) International Symposia.

The following is the discussion of (1) and (2).

2. Exchange of Students

a. General Situation

(1) The number of foreign students admitted into this university has increased yearly from 6 in 1975 to 30, 80, 123, 153, 190, 254, 306, 362, 406, 507, 556, 593 until 597 as of the present.

In response to this, Education Center for Foreign Students was established in 1984 to provide Preparatory Japanese Language Education, Advanced Japanese Language Course and Counseling Service.

Individual student's education and guidance has been conducted through a system of responsible academic adviser(faculty member) and a tutor(graduate student).

Problems on daily life and official affairs of foreign students are dealt with by the Division of International Relations. A general look into the present condition will reveal

that University of Tsukuba has accomplished much and ranks second to Tokyo University in admitting a great number of foreign students within its short history. It also ranks second to Tokyo University in the number of Japanese students sent to foreign countries. As of March 1988, Credit Exchange Agreement are established with 16 overseas universities.

(2) Admission of foreign students, curriculum guidance and obtaining degrees rest on each institution, and the problems of education for foreign students are deliberated on by the Council for Academic Affairs.

With the co-operation of these various sections, education for foreign students is regarded as successful.

b. Problems and Tasks

(1) When seen as a whole, "the merits of foreign students admission" is not yet properly understood.

Admission of foreign students should not end at simply providing instruction and research, but should also aim at the promotion of international understanding and co-operation.

Consequently, to accomplish this objective, the opportunity for active co-operation among the university staff is necessary.

(2) In 1954, the Japanese Government(Monbusho) Scholarship to foreign students was revised. Because of some problems, the former emphasis on "undergraduate foreign students" was changed, and in 1964 "research foreign students"(foreign students for the graduate level) has become the core. In case of this university, of 597 foreign students, only 55 are undergraduate, and the rest are graduate or research students with the aim of entering the graduate program of the university.

Under the present condition, there are certain cases where some academic advisers find difficulty in conducting proper guidance to foreign students. In this regard, the procedure for admission of research students should be more carefully done. Up to now, there are a few cases of research foreign students who return to their home countries because they cannot become regular students.

(3) There is no unified viewpoint on the standard of granting a degree to foreign students. The main goal of foreign students from "degree-oriented society" of developing countries is to complete the program and get a degree. Returning home without accomplishing this objective is considered a failure. Without the degree, their social status or position is not guaranteed, despite their high ability. This remains a serious problem for this university.

One of the reasons why obtaining a doctoral degree in Japan is difficult is that granting a doctoral degree too easily will not make the credential as meaningful as it should. Thus, realizing this, we would rather be careful and grant the degree to only the really qualified persons. Moreover, it is generally known that not so many professors in the fields of social sciences and humanities hold a doctoral degree. This might, to some extent, relate to the difficulty in students' obtaining the degree too.

The problem of obtaining a degree is also related to the academic standard and tradition of each country, and cannot be simply solved by this university alone.

However, as the pilot institution of the Japanese new universities, University of Tsukuba should award degrees, and, in doing so, fulfill its role as a forerunner in breaking the rigid

tradition.

(4) It is a university regulation that undergraduate students who do not obtain 15 units in one academic year will be expelled. At present, this rule is applied to foreign students, too. Nevertheless, because of language problem and some related educational problems, there are cases when this is not fair for them. Thus, there should be a flexible response to this, for example, not applying this rule at least in the first academic year for foreign students.

(5) There are certain inadequacies in meeting problems of foreign students concerning dormitories and other related problems such as lack of shower, the inconveniences of international phone, the shutdown of heating system during winter vacation, etc. There is a need to solve these problems by conducting a survey of present condition and problems.

(6) In addition to these, inadequacies are felt and seen in the provision of residence and services for foreign students families such as the Japanese Language Education, wellequipped dorms for married students and other facilities such as nurseries, a playground for their children, elementary and junior high school and the like. The co-operation of the community groups is needed, but the main task of improvement which rests on this university itself is not yet done at all.

Japanese Language Education is important to the foreign student's family as it is to the foreign student himself. There is a need for a special budget measure, and for this we would like to appeal to Monbusho for support.

(7) The role of the tutor for the individual language instruction to the foreign student is great, covering assistance in his/her general and special field of education, and support for his/her daily life. Evaluation of this worthwhile effort should be conducted in various related organizations, and these tutors who are slightly compensated at present should be given higher remuneration for their substantial efforts. Furthermore, the term of tutoring should be extended from only one academic year to two or three years, or even better, until the graduation of the foreign student.

(8) Although the government guarantees for the living conditions of the Japanese Government(Monbusho) Scholarship Students, there is a problem of being a guarantor for foreign students to enter the dormitories or private apartments because it assumes burden and responsibility on the professor's side. In case no problem occurs, the professor in charge is not affected, but in the contrary, if something happens, the professor has to take responsibility. Therefore, Monbusho needs to construct a system of guarantee for the foreign students.

(9) At present, no follow-up survey is conducted by this university. There is a need for this kind of survey which can serve as an important reference data for the improvement of education of foreign students in the future.

An overview of the problems above indicate that despite co-operation among the various organizations and other component staff, many problems arise due to a lack of uniform viewpoint and a lack of co-ordination between various organizations of this university.

Professors and organizations in charge have not only the prime responsibility of education, but also should co-operate im matters dealing with the foreign students' daily life.

3. Exchange of Teaching Staff and Researches

a. General Situation

(1) At present, there are 32 foreign teachers in this university contributing to internationalization of education and research. Apart from this, 20~30 part-time foreign instructors are employed. Furthermore, in Special Research Projects, foreign researchers are invited to uplift the international co-operation in interdisciplinary or large-scale research. There are also nationally or privately sponsored researchers totalling about 170~200 every year.

Compared to other national universities, however, the number of foreign reseachers and educators in this university is not so large, but considering its short history, this has been a good achievement so far.

(2) Meanwhile, the number of Japanese teaching staff and reseachers of this university sent abroad through the Monbusho, JSPS, JAICA, JF et. reaches a total of about 120 every year. Furthermore, overseas research trip conducted in accordance to International Academic Conferences, Symposia and Research Co-operation totals about 450~800 persons every year.

This obviously shows the active involvement of this university to international co-operation in the field of research.

b. Problems and Tasks

(1) There is a need for a more rapid progress of technological development and leading researches in the academic field to intensify international wisdom and co-operation, and a greater need for international exchange of "young" researchers.

Many graduates of Ph. D Program of this university are actively conducting research activities in various universities and research institutions in MDC(More Developed Countries) supported by these countries' funds. In Japan, however, there are few such provisions for "young" researchers from MDC due to an overemphasis on "researchers with outstanding achievements".

The number of foreign researcher invited to this university is exceedingly small compared to the number of foreign students. In those universities with long history, an independent International Exchange Fund is put up to support this program. Therefore, in this university, where such kind of program is not yet provided, the consideration over this matter is necessary. Moreover, there is also a need to invite "young" post-doctoral researchers from MDC as foreign teachers within a specified period of service.

Furthermore, there is very few system that invites assistant professors or lecturers from the developing countries, unless they are of "outstanding performance".

However, if Japan has to be contributive to the quality of academic research in the developing countries, then we need to devise the same system as we have proposed earlier, in inviting "young" researchers from MDC.

(2) As regards the distribution of foreign teachers, Council for Academic Affairs allots the number of foreign teachers needed in organizations in this university. Because of short negotiations done beforehand, however, the arrival of teachers is sometimes delayed causing disturbance in class arrangements.

In this regards, careful negotiations should be conducted in advance by the organizations concerned.

(3) Sometimes, troubles arise in appointment of foreign teachers. A thorough examination of procedure should be done. Besides, to strengthen true internationalization, the employment period(maximum 5 years) of foreign teachers should be re-examined and made more flexible.

(4) The present teaching load of foreign teachers of 12 hours a week seems to heavy. Because these teachers are also expected to actively participate in the international co-operation of research activities, we would like to request Monbusho for a flexible readjustment of their teaching load and increase in the support of their research expenses to the same level as that of the Japanese faculty members.

(5) In 1982, "The Special Law for Foreign Teachers" was enacted and foreigners can become assistant professor, associate professor, and professor in Japanese national universities. However, in practice, as of 1988 only about 70 foreigners across the country have been appointed according to the law. As for University of Tsukuba, only 4 foreigners have been appointed. More appointment needs to be done.

4. Concluding Remarks

The national policy regarding foreign students is to increase the number to 10 times that of 1983.

Considering the present condition of Japanese universities, this does not seem to be an easy task. To be able to promote international co-operation and at the same time directly deal with the problems of foreign students, this university, as the pilot institution of the Japanese new universities, must put up a middle and long-range plan based on sound argument that promoted this objective.

The following are the suggestions for this matter.

(1) There should be an allotment of proper number of foreign students in this university.

(2) International co-operation has been achieved by increasing the number of foreign students admitted ; however, international co-operation must also be promoted in terms of increasing the number of "young" foreign researchers. Therefore, while increasing the number of foreign students, the number of "young" foreign researchers should also be increased.

(3) It is necessary to promote staff exchange, especially, International Exchange of junior capable researchers and teaching staff.

(4) There is a need to evaluate the ratio of foreign students and researchers from MDC and those from developing countries in this university in order to adjust it for more proper ratio.

(5) There is a need for an effort to have a fairly good source of this university's independent fund to achieve its objective for international co-operation.

Nowadays the world is becoming more interdependent. Realising this fact, Japan is also trying to adapt herself to the changing scene and gear the nation towards the era of internationalization. Japanese universities, as the higer education institute, are entrusted

with the tasks and responsibility to contribute to the success of the nation's policy of internationalization. What the universities are undertaking is to respond to the nation's needs by promoting international co-operation in terms of exchange of students, teachers, researchers, and information.

However, as Japan has just entered the era of aiming towards internationalization, needless to say, there are yet many problems to encounter and to solve. It will still take quite a few more years before everything will be well settled. The government and universities have to co-operate and support each other for the fruitfulness of the policy.

Finally, as a representative of University of Tsukuba, I would like to invite all professors and scholars who are pleasant here to share the ideas concerning this matter with me. Your comments or recommendations would be appreciated.

Relationship between Caution Indices and Student Demographic Data in a Japanese Language Placement Examination Situation

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One objective in administering a test is to obtain a measure of an individual's ability level in order that some decision regarding that in dividual can be made. Often the decision is an important one that profoundly affects the individual.

The standard error of measurement (SEM) is the standard deviation of the *average* error variance taken across the entire sample of test takers. However, because it varies at different score levels (Lord, 1955), a recent issue of *Standards for Educational and Psychological Testing* (Committee of AERA, APA and NCME to Develop Standards for *Educational* and Psychological Testing, 1985) recommended that "standard errors of measurement should be reported at critical score levels. Where cut scores are specified for selection or classification, the standard errors of measurement should be reported for score levels at or near the cut score." (Standard 2.10. pg. 22). Some researchers are currently investigating various methods for calculation SEM at different score levels (Feldt, Steffen, and Gupta, 1985 ; Blixt and Shama, 1986).

Other researchers are studying methods for estimating measurement error at the individual examinee's level. Of particular interest are indices which identify examinees with unusual response patterns. These have been studied by a number of researchers (Harnisch and Linn, 1981 ; Harnisch, 1983 ; Tasuoka and Linn, 1983 ; Tatsuoka, 1984 ; Birenbaum, 1985 ; Jarjoura, 1986 ; Tomsic and Mittman, 1986 ; Tomsic, Schellenberg and Mittman, 1987 ; and Jaeger, 1988)

These indices and indicators of the deviation af actual responses from responses predicted by a model Sato's Caution Index (Sato, 1975), for example, is described by Harnisch and Linn (1981). It identifies individuals whose actual responses deviate from the expected pattern which is one in which an individual who responds correctly to a particular item will answer all easier items correctly. The expected pattern, in other words, is a Guttman scale (Guttman, 1941). Individuals with aberrant response patterns are identified by a large Caution Index. Harnisch and Linn (1981) modified Sato's Caution Index and called it the Modified Caution Index (MCI). It yields an index which has a lower bound of 0 and an upper bound of 1. The following is the formula for the MCI.

$$C_i^* = \frac{\sum_{j=1}^{mi} (1-uij)n\cdot j - \sum_{j=mi+1}^{J} uijn\cdot j}{\sum_{j=1}^{mi} n\cdot j - \sum_{j=J+1-mi}^{J} n\cdot j}$$

i = 1, 2, ··· I indexes the examinee

j = 1, 2, ··· J indexes the items
uij = 1 if examinee i answers item j correctly
= 0 if examinee i answers item j incorrectly
ni. = total correct for the ith examinee
n.j = total correct responses to jth item

As the reader can see, the formula for MCI incorporates subject and item scores (as represented by ni. and n.j). Ayabe and Heim (1988) proposed a sample-dependent measure of response pattern aberrance called the Person Average R (PAR). PAR is of obtained by calculating the average correlation of each individual with the n-1 other people taking the test. This method is based on a suggestion by Kuder and Richardson (1937) for estimating the reliability of a particular item in a test. In their derivation of KR20, Kuder and Richardson suggested using the average correlation of item i with the n-1 other items in the test as one way to estimate the reliability of a particular item. By transposing the item by person matrix of test item responses and correlating each test taker with every other test taker, it is possible to calculate the average correlation for each individuals whose test response patterns are markedly different from those of their fellow test takers.

PAR calculated in this way does indeed correlate highly with certain indices of response aberrance. A pilot study was done using the data provided in Harnisch and Linn (1981), and PAR correlated -.99 with the Modified Caution Index (MCI), -.94 with the Disagreement Index, an .97 with the Norm-Conformity Index. These correlations may be inflated, however, as the computations were done on a small, artificial data set. When PAR was plotted against these response aberrance indices, it was evident that even with a small data set PAR provides a finer discrimination among individauals.

As to what exactly aberrant response patterns indicate, they have been studied in connection with motivation (Birenbaum, 1985), guessing (Nelson and Chatman, 1986), differences in schooling (Harnisch and Linn, 1981), and also hypothesized as being related to cheating and poor test-taking strategies (Levine and Rubin, 1979) and carelessness (Smith, 1986).

The purpose of this study was to investigate whether MCI and PAR are valid indices to use in interpreting placement test scores, whether these indices could be used to detect students with unusual educational backgrounds with regard to the way they learned Japanese, and to detect subjects who are testwise.

1. Method

Data from the Japanese Language Placement (JLP) test which is administered by the East Asian Languages and Literatures Department at the University of Hawaii at Manoa was used. This test was developed by Department and has been in use for about ten years for placing students into appropriate Japanese language course levels. All students with any previous exposure to the Japanese language are required to take the test before enrolling in a Japanese language course at Manoa. Because Japanese is not a unique language in Hawaii, approximately three fourths of all students who wish to enroll in a course at manoa

have had some background in the language.

JLP test data was collected in March and April. Subjects Were Fall 1988 incoming freshmen. In all, 367 students took the test, of which 221 agreed to participate as experimental subjects. Experimental subjects completed a questionnaire in which they guessed their number correct score and provided responses to 10 specific and one general question regarding their test-taking skills. All students were asked to provide demographic data on the Department's Background Information Sheet. These included number of years that Japanese was studied, number of years of residence in Japan and age at the time of residence, and access to native speakers of Japanese. In addition, feedback from the high school Japanese language teachers of the subjects was solicited in May. Based on their knowledge of their students' ability levels, high school teachers were asked to rate the motivation of each student to do well in Japanese language study. They were also asked to rate each student's test-taking skills and each student's margin of error. The margin of error was defined as the consistency of a student's performance at his of her ability level. Teachers were asked to rate a student whose performatnce was excellent one day and poor the next as having a wide margin of error and to rate a student who performed consistently from day to day as having a narrow margin of error.

MCI and PAR were calculated for the experimental subjects. Intercorrelations among these variables were calculated and test-taking skills questions were also regressed on MCI, PAR and raw score.

2. Results/Discussion

MCI and PAR were highly correlated ($r=-.93$, $d.f.=219$, $p<.01$) such that, the higher a person's MCI, the lower his or her PAR. Since a low PAR indicates a person whose response pattern is dissimilar to that of his or her fellow test takers and a high MCI indicates a person whose response pattern deviates from the expected Guttman pattern, this relationship between MCI and PAR seems unexceptional. MCI and PAR differed, however, in their relationship to raw score. MCI and raw score were related ($r=-.30$, $d.f.=219$, $p<.01$), but PAR and raw score were not (see Table 1). In other words, PAR and MCI were related, but raw score was significantly related to MCI only, and not to PAR.

Table 1. Correlations among Total Score, MCI and PAR

N = 221

	Raw Score	MCI	PAR
Raw Score	1.00	−0.30	0.03
		(.0001)	(n.s.)
MCI		1.00	−0.93
			(.0001)
PAR			1.00

As can be seen in Table 2, raw score was correlated with placement level ($r=.92$, d.f.$=212$, $p<.01$), which was expected since placement level is based on the number of items answered corectly. Also related to raw score were the various demographic variables, number of years of Japanese language study in school ($r=.41$, d.f.$=365$, $p<.01$), number of years of Japanese language study in language school ($r=.44$, d.f.$=365$, $p<.01$), native speakers of Japanese at home ($r=.38$, d.f.$=365$, $p<.01$), years of residence in Japan ($r=.29$, d.f.$=365$, $p<.01$) and age of student at the time of residence in Japan ($r=.23$, d.f.$=365$, $<.01$). More exposure to Japanese meant a higher raw score.

A higher raw score, furthermore, was related to a more accurate self-assessment with regard to knowledge of Japanese. Students were asked to guess the number of items they answered correctly. The absolute value of these guessed scores minus the raw scores (GMR), was found to be related to the raw score ($r=-.26$, d.f.$=219$, $p<.01$). The relationship was one in which higher scores were better at assessing their Japanese language knowledge lev

MCI was negatively related to the placement level ($r=-.31$, d.f.$=212$, $p<.01$), such that students who were placed at higher levels tended to have lower MCIs than students who were placed at lower levels (see Table 3). This is not surprising since both MCI and placement level wre related to raw score. For the same reason, it is not surprising that PAR was not related to placement level, because PAR and raw score were unrelated.

Table 2. Correlations between Raw Score and Selected Other Variables

Raw Score	r	probability	n
Placement Level	0.92	0.0001	214
Guessed Score	0.69	0.0001	221
Guessed Minus Raw Score (GMR)	-0.26	0.0001	221
Modified Caution Index (MCI)	-0.30	0.0001	221
Person Reliability (PAR)	0.03	0.6558	221
Yrs of Jpn study in High School	0.41	0.0001	367
Yrs of Jpn study in Lang School	0.44	0.0001	367
Native Speakers at home	0.38	0.0001	367
Yrs/Residence in Japan	0.29	0.0001	367
Age of Residence in Japan	0.23	0.0001	367
Motivation (Teacher Rating)	0.09	0.3007	139
Test-taking (Teacher Rating)	0.12	0.1756	138
Margin of Error (Teacher Rating)	-0.13	0.1312	135
Test-Taking Skill Item X2	0.27	0.0001	220
Test-Taking Skill Item X5	0.14	0.0386	220
Test-Taking Skill Item X6	0.16	0.0182	220
Test-Taking Skill Item X11	0.20	0.0026	220

With regard to the demographic variables, the number of years of Japanese language study both in high school and at language schools tended to reduce a student's MCI ($r=$

-.24, d.f.=219, p<.01 for years of Japanese studied in high school and r=-.15, d.f.=219, p<.05 for years of Japanese studied in language school). In other words, more study, higher raw scores, and lower MCIs were all related. the other demographic variables were not related to MCI. This was not the case, however, with PAR. As can be seen in Table 3, PAR was negatively correlated with native speakers of Japanese at home (r=-.19, d.f.=.219, p<.01), years of residence in Japan (r=-.21, d.f.=.219, p<.01) and age at time of residence (r=-.15 d.f.=219, p<.05). Since a low PAR indicates a student who is unlike his or her peers, these negative correlations show that students who had lived in Japan or who have acces to native speakers of Japanese at home are different from their peers with regard to the knowledge of Japanese that they possess. Since PAR is not related to number correct score, it is not simply that these students know more Japanese than their peers, but that they are different in some other way.

Like MCI, the number of years of Japanese studied in high school was related to PAR (r=.14, d.f.=219, p < .05), indicating that as a student studies Japanese in a formal setting, his or her knowledge becomes more like that of his or her peers. Years of Japanese studied at a Japanese language school, however, was not related to PAR. A possible explanation for this might be the variability of the curricula at different language schools.

With regard to feedback from the students' high school Japanese language teachers, both MCI and PAR were related to the teacher ratings of student's motivation level to do well in Japanese language study (r=-.25, d.f.=83, p<.05 for MCI and r=.25, d.f.=83, p<.05 for PAR). MCI was also related to the teacher's estimation of their student's margin of error (r=.25, d.f.=83, p<.05).

Table 3. Correlations among MCI and PAR, and Selected Other Variables

	MCI			PAR		
	r	probability	n	r	probability	n
Raw Score	-0.30	0.0001	221	0.03	0.6560	221
Placement Level	-0.31	0.0001	214	0.09	0.1840	214
Guessed Score	-0.25	0.0002	212	0.11	0.1210	212
Guessed Minus Raw Score(GMR)	0.01	0.8410	212	0.10	0.1340	212
Modified Caution Index (MCI)	-	-		-0.93	0.0001	
Person Reliability (PAR)	-0.93	0.0001	221	-	-	221
Yrs of Jpn study in High School	-0.24	0.0004	221	0.14	0.0334	221
Yrs of Jpn study in Lang School	-0.15	0.0296	221	-0.01	0.8580	221
Native Speakers at home	0.04	0.5720	221	-0.19	0.0059	221
Yrs/Residence in Japan	0.03	0.6500	221	-0.21	0.0015	221
Age of Residence in Japan	0.05	0.4470	221	-0.15	0.0277	221
Motivation (Teacher Rating)	-0.25	0.0235	85	0.25	0.0210	85
Test-taking (Teacher Rating)	-0.17	0.1218	85	0.18	0.1060	85
Margin of Error (Teacher Rating)	0.25	0.0230	82	-0.19	0.0790	82
Test-Taking Skill Item X2	-0.12	0.0955	220	0.01	0.8552	220
Test-Taking Skill Item X5	-0.03	0.6266	220	0.00	0.9798	220
Test-Taking Skill Item X6	0.01	0.8747	220	-0.05	0.4253	220
Test-Taking Skill Item X11	-0.02	0.7525	220	-0.05	0.4801	220

Data on test-taking skills were gathered from two sources. Teachers were asked to rate their student's test-taking skills and students were asked to rate their own test-taking skills (X11) and to respond to 10 specific test-taking skills items (X1 through X10). When these items were regressed onto raw score, the best regression model found was the following :

$$\text{raw score} = 15.24 + 2.43\,X2 + 2.03\,X5 + 1.76\,X6 - 2.68\,X10,$$

with the multiple correlation being .35. The four test-taking skills items were as follows :

X2 = I enjoy tests which are challenging.
X5 = On multiple choice test questions I use a Process of elimination to improve my chances of getting the right answer.
X6 = My mind wanders a lot when I take a test.
X10= With multiple choice questions, I read all answer options before selecting an answer.

Taken together, these itesm predicted approximately 12 percent of the variance in the raw score. However, the best regression model could account for no more than five percent of the variance in PAR or in MCI. Since three of the 10 specific items, as well as X11 were correlated with both raw score and placement level(see Table 2), one might expect them to be related at least to MCI but this was not the case. None of the test-taking skills items were related to MCI nor to PAR (see Table 3).

3. Conclusion

MCI and PAR were calculated for 221 subjects on their Japanese Language Placement test results and correlated with various demographic data, teacher ratings of students' motivation, test-taking skills, and margin of error, as well as students' self-rating of testtaking skills. Neither MCI nor PAR were related to test-taking skills. PAR, however, was related to whether or not a student lived with a native speaker of Japanese and also to years of residence in Japan. As such, PAR may be useful as an indicator of unusual backgrounds with regard to exposure to Japanese. Because MCI was found to be related to raw score and therefore redundant, of the two indices investigated PAR is the preferred index for added information interpreting placement test scores.

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Direction of Activation For Cooperative Education in Higher Education

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1. Introduction

The importance of cooperative education began in earnest during the 1960s. Especially, cooperative education has been emphasized since the Industrial Educational Development Act was promulgated in 1963 and by the Act, those students who majored in the fields of agriculture, technical and engineering, fishery and marine at high school, junior college, and four year college should take supervised occupational experience for one or six months dependent upon their major areas[1].

However, neither meaning of school-industry cooperation nor purposes, principles, and systems of cooperative education were exactly defined to fit Korean situation. Therefore, it is sometime difficult to find present situation, problems, directions of cooperative education based on theories of cooperative education.

Fortunately, in recent years studies on cooperative education had been carried out by Korean Society for the Study of Vocational Education, Korean Council for University Education, and Presidential Commission for Educational Reform. So the writer is going to present the results of the studies.

Before discussing on the cooperative education, one thing to clarify is meaning of cooperative education. More than twenty scholars defined school-industry cooperation, cooperative education, sandwich system, dual system, etc.[2] Reviewing the definitions, the writer may define that school-industry cooperation is interchange of human resources and materials between school and industrial circles for mutual development. Types of school-industry cooperation can be classified into subsystems as Table 1 based on the purpose, kinde of resources, subjects, and characteristics.

As shown on table 1, cooperation between industrial circles and school circles are composed of cooperation for education and research. The former is cooperative education and a part of school-industry cooperation.

For effective cooperative education, it should be carried out under the principles of cooperation, spontaneity, education and mutual benefits.

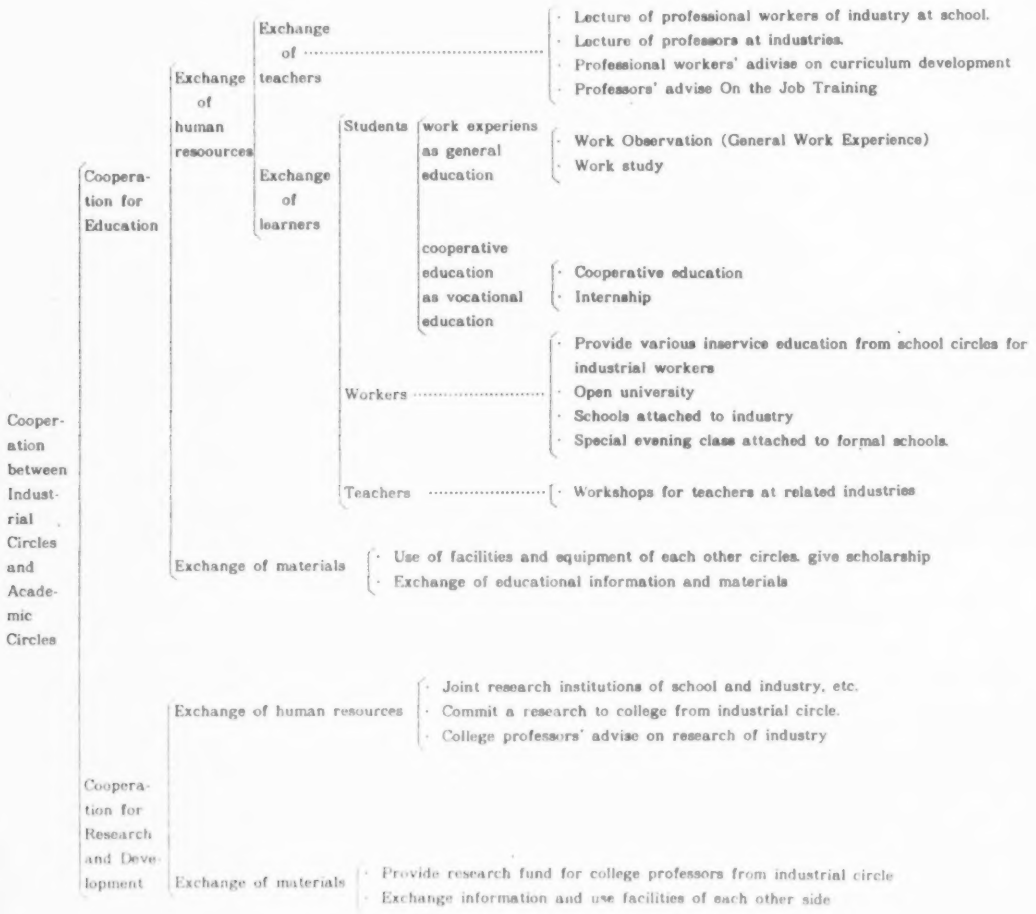
2. Present Situation and Problems of Cooperative Education in Higher Education

Present situation and problems of cooperative education in higher education may be discussed in view of interchange of resoure persons, learners and materials as shown table 1.

The situation and problems described in this article were results of studies by Korean Council for University Education(KCUE), Korean Society for the Study of Vocational

Education, and Presidential Commission for Educational Reform. Statistical data presented here were cited from the study of KCUE. The study collected data from 102 chairpersons, 31 associate deans of academic affairs, 417 students of colleges of agriculture, business administration, medicine, pharmacy, and natural sciences of 10 universities.

Table 1. Types of School–Industry Cooperation


Cooperation between Industrial Circles and Academic Circles
Cooperation for Education
Exchange of human resources
Exchange of teachers
· Lecture of professional workers of industry at school.
· Lecture of professors at industries.
· Professional workers' adivise on curriculum development
· Professors' advise On the Job Training
Exchange of learners
Students
work experiens as general education
· Work Observation (General Work Experience)
· Work study
cooperative education as vocational education
· Cooperative education
· Internship
Workers
· Provide various inservice education from school circles for industrial workers
· Open university
· Schools attached to industry
· Special evening class attached to formal schools.
Teachers
· Workshops for teachers at related industries
Exchange of materials
· Use of facilities and equipment of each other circles. give scholarship
· Exchange of educational information and materials
Cooperation for Research and Development
Exchange of human resources
· Joint research institutions of school and industry, etc.
· Commit a research to college from industrial circle.
· College professors' advise on research of industry
Exchange of materials
· Provide research fund for college professors from industrial circle
· Exchange information and use facilities of each other side

(1) Participation of the Enterprise Personnel in College Teaching and of Faculties in Related Industries

There are two ways for enterprise personnel to participate in college teaching. The one is taking charge of a regular subject and the other giving special lecture on a topic as resource person. According to the results of the study, out of 102 departments, 16.8 percent invited enterprise personnel for taking charge of a regular subject and 15.8 percent for giving special lecture. Especially, 58.3 percent of departments of college of engineering and 54.2 pencent of departments of college of agriculture invited them as

instructors. 89 percent of college students and 54.2 percent of department chairpersons responded that college teaching of enterprise personnel was very useful.

On lecturing of faculties to enterprise, 60.8 percent of departments left it everything to professor's discretion, and 18.6 percent did not recommend it. 74.8 percent of department chairperson's thought that faculty's participation in enterprise's education or advice consequently contributed to improve college education.

In case of four year college, 92.5 percent of department chairpersons answered that they did not invited industrial personnels as resource persons for their curriculum development. However, in case of junior colleges. It is almost indispensible condition to invite industrial personnel for their curriculum development.

There were some problems on interchange of resource persons between school and industrial circles. Main problems were no organzation to coordinate for interchange of resource persons, lack of quilified persons to meet standard, high wage of instructors or resource persons, negative attitude toward participation for college teaching of industrial personnel, and heavy teaching loads of most of college professors.

(2) Interchange of Learners

Learners in cooperative education can be classified into three categories ; college students, faculties, and industrial personnel.

Most of college students take supervised work experience program. Especially, students of colleges of agriculture, engineering, marine and fishery should take supervised occupational experience for one or two months by the Act of Industrial Education Development (AIED). The rest of departments of college offer the program variously depending upon the siuation. According the result of study, out of 35 colleges, 35.5 percent offer the program by the AIED, 29 percent as a part of major subjects, and the rest of them are just offer the program for field trip.

Main purposes for offering cooperative education were to provide students for understanding relationship between learning at school and real world of work of their major areas and developing competencies for getting job.

For the training of industrial training, out of 102 departments, 73 percent offering inservice program seminar or workshops(21%), short length course(11%), and graduate school program.

Generally speaking, junior college professors visit industries of related to their major areas to get information and to participate in workshops provided by the industry. However, faculties of four year colleges do not visit industries so often to get information.

There are some problems on interchange of learners. Main problems on student's supervised occupational experience program are lack of financial support, difficulty of selection of industries, no organization taking charge of the program at both of school and industry, and no good program for supervised experience. Some problems on inservice training for industrial personnels are lack of systematic organization in colleges and limitation of entrance examination in graduate school for industrial personnels and expensive fees and tuitions.

(3) Interchange of Materials

Interchangeable materials between college and industrial circles are furniture and equipment, printed materials and scholarships. Usually, college professors use furniture and equipment of industrial circles and printed materials are interchanged. However, scholarships are usually donated by industries.

However, most of furniture and equipment are so expensive that interchange of them are not active.

3. Toward the Improvement of Cooperative Education

(1) Administrative and Financial Support

As a prerequisite for the activation of cooperative education, the following administrative and financial measures are suggested :

a. Reducing the obligatoriness in work experience education prescribed in the Industrial Education Development Act
b. Revision of school regulations which may restrict the cooperative education in the real sense
c. Financial support necessary for cooperative education
d. Establishment of the cooperative education body
e. Activation of education and research on cooperative education
f. Endowment of special benefits such as tax redemption to the industry for the activities related with school industry cooperation

(2) Work Experience Education for College Students

For the systematic work experience education the following factors should be taken into consideration in deciding patterns, guidance organization, and administrative management of experiencial education.

1) Patterns
   a. school year : 1st－2nd semester of junior
   b. patterns ─┬ long-term : more than 3months
      ├ middle-term : 4 weeks
      └ one day a week : one day every week
   c. Curriculum ─┬ basic curriculum : 1 week or so
      └ work experience at field
   d. Credits : credits are assigned depending on the patterns :
      12－15 credits for long-term pattern
      4－5 credits for middle-term pattern
      2－3 credits for one day a week pattern
2) Planning and guidance
   a. designation of a guidance professor to each student
   b. Selecting and securing the industries for work experience : before the beginning of the semester

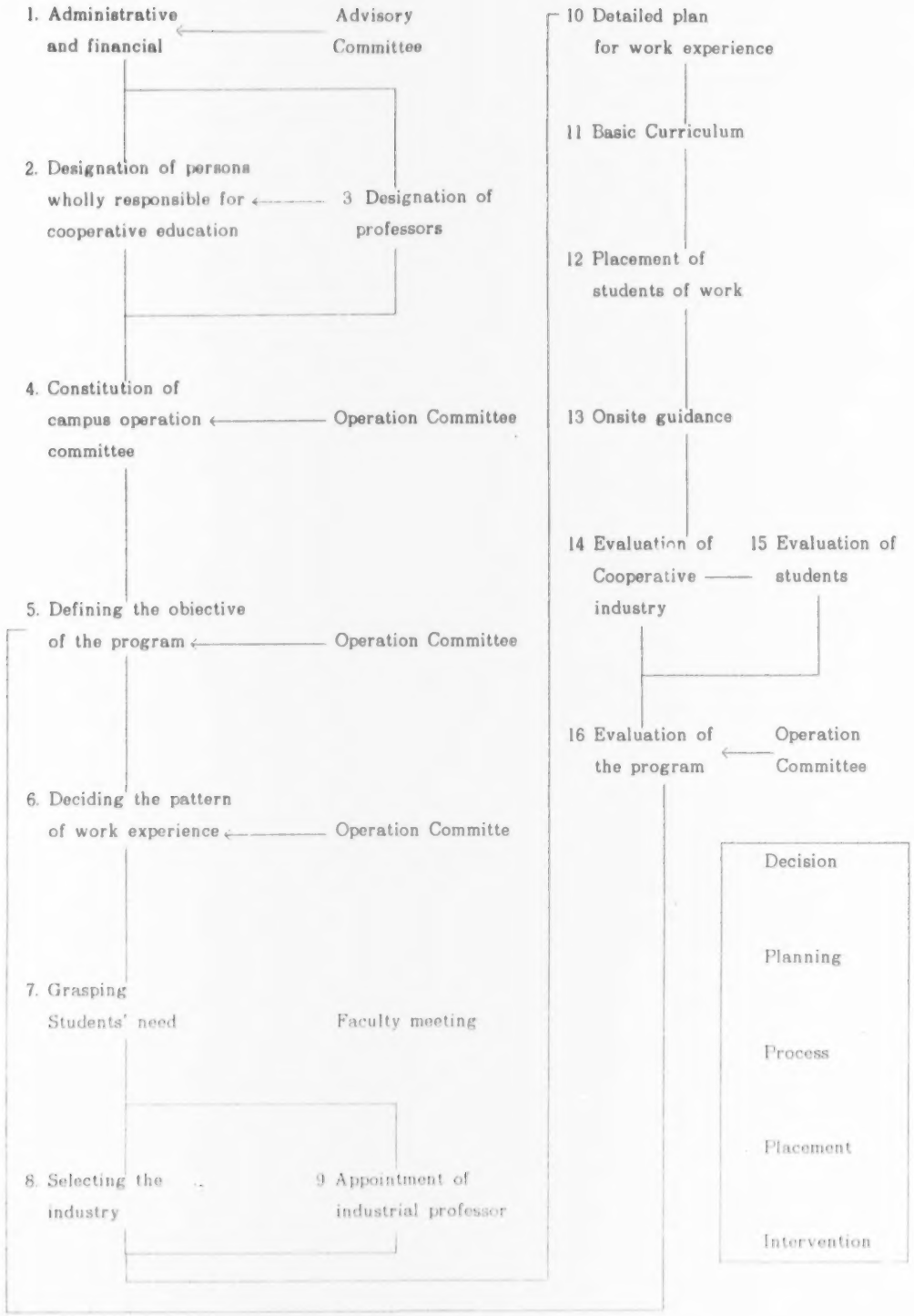


Fig 1. Managerial Model of Work Experience Education

c. Collecting student's work experience proposal : around the end of the second semester of sophomore
d. Assignment of the industry to each student
e. Appointment of industrial professors at the industry
f. On-site guidance by the guidance professor
g. Evaluation of work experience on the basis of the apprasal by the industrial professor and the result of on-site guidance by the guidance professor

3) Organization
a. Advisory Committee for school-industry cooperation : Dean, head of local administrative body, representative of the industry (acting dean who is responsible for cooperative education takes the role of executive secretary of the Committee)
b. University-industry cooperative body at the campus : this body is under the guidance of Dean and is called Office of University Industry Cooperation or Office of Education Cooperation.
c. Professors responsible for cooperative education at each department : department chair or other professor wholly responsible for cooperative education.

4) The process of Administrative management

(3) Educating Industrial Workers

In return for the help provided by the industry in the way of work experience education, university can also give a helping hand to the industry with educating industrial workers. For industrial workers such as graduate school level education (Master degree course or joint research program) and undergraduate level education.

Below is the analysis table 〈table 2〉 which tells about ① the objectives ② terms of education ③ types of lectures and attendance ④ qualification for the application and selection ⑤ tuitions and finance of each course

(4) Cooperative Scholarship Program between Industrial Circles and Academic Circles

1) Local enterprises and industrial companies jointly establish a 'cooperative scholarship committee between industrial circles and academic circles (Instead, advisory committee for the cooperation between industrial circles and academic circles can do the work), and perform the scholarship programs with the help of scholarship committees of universities.

2) Grantees may work for the supporting industry or not according to the objective of the scholarship.

3) The committee selects and manages the grantees on the university base or department base according to the request of industry.

(5) Other Cooperative Educations between Industrial Circles and Academic Circles

1) Lectures of professional workers of industry and research institute at university ; Active support on the side of industry is required for the effective use of high-leveled human resources, Governmental department in authorities should encourage it.

2) Lectures and advice of professors at industry ; Though some professors already give lectures and advices formally or informally as far as such activities do not interrupt

Table 2. Analysis table for educating industrial workers

course / elemennt	Master Degree Course	Joint Research Pragram	Education of Major
objective	acquisition of M. A. degree	joint research or listening to lectures according to necessity of industry and/or individual	non-regular education of major for the industrial workers
terms	3yr : 24 credits for 2yrs, thesis for 1yr	1~3yrs according to necessity	several weeks or months according to necessity
types of lectures and attendance	afternoon and night attendance with lectures at fixed times	full-day · attendance with reasearch and lectures	full-day attendance with concentrated lectures or afternoon and night attendance with lectures at fixed times
qualification for the application	a man at work with B. A. degree and more than 2 years' work experience	the same with the left	workers recommended by industrial company
selection	selecting a man of ability for studying and research, and recommended by industrial company	the same with the left	no selection, making classes according to the ability
expenses & finance	scholarship given by industrial company or Paid by studerts	research grant given by industrial company	grant given by industrial company

their works at school, it is desirable for the university to allow such activities formally.

3) Encouraging the participation of industrial personnel in developing university curriculum and educating materials.

4) Students' work observation ; It is desirable to make a regular program which enables students to observe connected industries once or twice each year.

5) Mutual offer and use of facilities ; Not only experimental facilities but also school ground and auditorium can be used in common.

6) Mutual exchange of educational materials and information.

7) Students' work study ; students can work at night during vacation or during terms.

8) Friendly activities between industrial circles and academic circles ; Sports, mountain climbing, picnic and other activities can be used for the friendly relation between industrial circles and academic circles.

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The International Nature of Science Education

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1. Natural Science itself has an international nature, because it deals with only those phenomena which have universal validity to anyone, andwhere and anytime. However, the teaching of science can be affected by various factors depending on to whom, where and when it is taught.

When science education refers to the teaching of science to students at primary and secondary education levels or at non-professional higher education level, it can and must be done through the use of the native language in the most effective ways appropriate to those students, though the scientific content is universal. Thus, the teaching of science has to be designed according to the needs of those students who have different knowledge and ability backgrounds with respect to science.

Similar considerations hold for the training of science teachers.

On the other hand, if science education refers to the training of science professionals as well as researchers, its international nature must be emphasized, and its language of instruction may not necessarily be the native language.

2. One has to adimit that science research papers of internationally high standard are now overwhelmingly published in English, and also that most of the literature for science study is available in English.

As an apt example, the Physical Society of Japan, of which I am a member (and have served on the Executive Committee for several years), issues three professional journals published in English. These are the *Journal of the Physical Society of Japan*, *Progress of Theoretical Physics*, and the *Japanese Journal of Applied Physics*, in addition to one Japanese periodical, *Butsuri*.

The Physical Society of Japan, having started in 1946 as one of the successors of the Physico-Mathematical Society of Japan, which was founded in 1877, is the single professional society of physicists in Japan, and its total membership is now over 14,000.

At present, only original papers written in English (although French and German are also acceptable) can apear in the above-mentioned three journals, though original papers written in Japanese were published in the Japanese periodical until 1951.

This same kind of situation can be clearly seen in professional journals in other countries. Table 1 shows the change in percentage, over five year periods, of English-original papers which appeared in journals related to the French Physical Society, as well as to the German Physical Society.

Scientists all over the world are more and more depending on the English language as their means of communication in international conferences, as well as in person-to-person discussion.

Therefore, this tendency should be taken into consideration, especially in science programs

Table 1. The Percentage of English-Original Papers Appearing in French and German Journals

Journal \ Year	1957	1962	1967	1972	1977	1982	1987
Jpurnal de Physique	0	0	0	20	69	84	95
Zeitschrift für Physik	7	10	46	77	97	100	100

for Higher Education in the Asia-Pacific Region.

3. Our univesity, ICU, opened its science graduate program in 1987. Though it is a small program—at present we have only a two-year Master's Course with a student quota of ten every year—it will be extended to include a Doctor's Course in the very near future.

Our science graduate program aims to educate scholars of excellence and/or professionals of a new type : those who can break new ground from intergrated viewpoints and develop a flexible searching spirit for truth, as well as the ability to make comprehensive judgments : and who can adequately meet the academic and social needs of the future. Therefore, the students are requested not only to study one of the specific areas in natural science, namely mathematics, physics, chemistry and biology, but also to learn plural methodologies by surmounting the traditional barriers between these different areas of study.

As to the language requirement, our science graduate program requires of the students no other languages other than Japanese and English ; and proficiency only to a moderate degree in Japanese (to the extent of presenting no serious difficulty to students in their campus life) is required of overseas students.

I should like to emphasize that the door to our science graduate program is now open.

Curriculum Reform for Cultural Literacy

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1. Introduction

It is not an exaggeration to say that we are living in an information society. As Alvin Toffler writes, we are transformig from the techno-sphere to revolutionizing the info-sphere. Information is disseminated with the fast development of new technology media such as satellite communication system and computer system, instantaneously through the worldwide.

The information society needed highly educated people in every fiedls. Therefore, the aspiration for higher education is getting higher each year and the university population has been increased tremendously. For instance, in Korea, the number of higher education institution has increased from 19 in 1945 to 233 in 1987. College and university enrollment indicates that 7,819 in 1945, 107,687 in 1960, 597,936 in 1980, 1,540,381 in 1987, which represents more than 196 times compared with the higher education population in 1945.

If the purpose of education is not just aimed for upward social mobility and higher income, then, it is necessary to be gained confidence in their own identity which can created healthy goals for society.

Objectively speaking, the high aspiration for college education and the increased number of higher education population should contribute to international understanding and cooperation. However, did it really bring about understanding and cooperation among nations? Has it helped us to be aware of ourselves, our neighborhood, and the existing problems of our society?

The tremendous number of university students, and the increased amount of information have not helped us to be aware of our society nor made us understand each other. Knowledge has spread, but we are suffering from fear of war, alienation, and loss of self-identity. One of the reason for this is that the university curriculum is not properly formulated. Curriculum in higher education is a powerful formative force, but thus far curriculum unfortunately has been used as a convenient distributory device for readymade messages.

The greatest public service higher education can perform is to develop people prepare to help solve society's emerging problems-who can articulate their own needs, who can understand the need of others, and who can thus go on to create new goals and develop new forms of learning and doing. However, the curriculum in higher education hardly meet the indicated needs of students. Sitting in a large classrooms, listening to an elaborate pattern of words from a distance faculty member, students seldom find the way to even ask a question. Even in a seminar class, a heady and competitive academic sytle so dominates discussion that real feelings and the ideas implicit in them are rarely developed.

The changing pace of our society is far advance than the development of curriculum.

In terms of technology development, industry in our society has been used robots for some many years. But opening a course about robotics(CAD-CAM) in university is far behind than the industry's utilization of it. This is not just applied to technology and science fiedls, but same as social sciences and humanities. The society is changing so fast but curriculum in higher education sleeps largely under the name of basic prerequisite courses.

Under the circumstances, how the higher education can help to promote mutual understanding and cooperation? How, then, should curriculum be formulated so that it can help us to be aware of ourselves, our neighborhood, and society at large? These are not easy questions to answer, because we are having difficulties in communicating even on an individual scale.

The purpose of this paper is to tentatively answer these questions through the following three existential points of view, which are expressed as construction of reality, freedom of choice, and dialogue, in relation to curriculum reform for cultural literacy.

2. Construction of Reality

In the process of life we construct our own identity by encountering everyday reality. But the most people encounter the reality which is already as the external world made it, objectified through the pre-defined value system. How often do we hear the objectified value statement such as the oriental is polite, Harvard graduates are smart, women talk a lot, etc? These objectified cultural assumptions are assimilated into one's consciousness at a taken-for-granted level. Thus we legitimize it in a social setting rather than reconstructing it with our own experience. In other words, the everyday lives of most people involve encountering a reality already structured for them by society. What they communicate is thus largely shaped by what others have already legitimized. As a consequence, what they externalize through communicative acts may be only a restatement of already shared and socially legitimized reality. The danger of this situation is that people who are accustomed to this reality see things the same way other people do, and in time socialize others to see the same things. One who has grown up with this taken-for-granted reality may never realize that he possesses the freedom to reinterpret the cultural assumptions. Without this awareness, inasmuch as he will depend largely upon other's interpretations, he cannot take control of his own existence. He would not understand freedom as it is expressed in everyday moments of conscious life and that it must be viewed as characteristic of consciousness itself.

Thus far university curriculum has played the role of contributing to the taken-for-granted level of assumptions rather than counteracting them. Students who are getting information through text books and faculty members are most likely building vicarious experience without proper contact with reality. The content of the text books and lectures may indoctrinate the values which is already typificated and legitimized by the society.

The students who take these curriculum without questioning them take the values for granted. What is worse they internalize them into their own consciousness and through communicative acts they pass them on to other people. Therefore, they strengthen uniformity rather than respect individual differences. One of the responsibility for higher education

is to encourage them to unlearn these taken-for-granted cultural assumptions. What needed in university is the development of new curriculum materials that provide the students with an opportunity to develop the awareness and skills necessary for decoding how his culture influences his existence. It is important to design curriculum for students to explore the interface between the student's existential self and the social-cultural milieu. This means establishing a sense of connectness between whatever part of the culture is to be studied and the experience of the students.

In order to learn the other country's culture, it is necessary for students to move beyond the classroom by going out into the other countries where the descriptive accounts would be real experience and not theoretical excercises initiated by a professor. For example, if the subject of the curriculum is Korean culture, then, it would never be sufficient enough to understand the profound, delicate, and complicated Korean culture only by reading some text books and lectures. Every country has it's own hidden culture and it is impossible to understand it without having to experience the culture directly. How can a person possibly understand the basic values, ethics, and aesthetics of Korea which is derived from Confucianism, Taoism, and Buddhism by only reading some text books and listening to lectures.

For example, the concept of URE-RI(義理) is one of the basic values of Korean interpersonal relationship which derived from confucianism. The term of URE-RI has three major meanings. The first is justice, righteousness, duty, morality, probity, and intergrity. The second meaning is obligation, a debt of gratitude, loyalty and faithfulness. The third meaning concerns the proper realtioship between people used in such contexts as URE-RI between lord and retainer, or URE-RI between friends. Such a complicated and sensitive meaning is hard to understand by the language, which expressed objectified linear matter. This meaning can easily grasped by having an interpersonal relationship directly with a Korean who values URE-RI very highly.

It is a very important matter to allow people to encounter culture directly from their own experience. Our identity should be derived from out subjective dimension which is formulated by the reinforcement of our daily experience. Therefore, reality is reconstructed in ourselves rather than at the taken-for-granted level. Thus, we become a co-producer of our definitions of reality rather than being a passive consumer of ready-made explanations that are largerly mythical in content.

3. Freedom of Choice

Freedom is connected closely with the individual's conscious experience in everyday life. The individual's interpretations of the exprience he undergoes, what he imagines as possibilities, and how he relates his interpretations to other aspects of his frame of reference are all examples of freedom being expressed. If freedom and consciousness are identical, then freedom is inescapable.

There is something paradoxical about the human situation in that the individual can use his freedom in a way that undermines his own autonomy. He chooses to amalgamate into his own explanatory framework other people's explanations of what is real. In this way he avoids the risk of making his own interpretations. This allows him the illusion

or escaping responsibilities for his own existence ; he can then live a life of existential anonymity. Once, our class had to take the philosophy final exam in order to pass the course. At that time we thought we weren't ready fot it. Since the professor had been emphasizing the importance of "freedom of choice." we asked if we had any freedom to choose in that situation. He answered that "If you take the exam you'll pass the coures. However, if you don't then you'll flunk. This is your choice."

Man inescapably populates this world in the company of other man. In conjunction with his fellows, man has the power to shape the world to his own ends, formulating a reality of his own choice but only in so far as he recognized the limitations imposed by the nature and the rights of his fellow inhabitants. For example, one country decided to beautify their own history for the next generations, but if the content is distorted to the nearby countries, it should not be beautifized. As we seek to change our world, within these constraints, we in ourselves will change ; we shall become an intergral part of our consciousness.

One of curriculum's responsibilities is to promote awareness of the freedom of choice among the students, whom may not even know that they have this freedom. One way to approach this problem is by presenting the existing pluralistic social views rather than indoctrination by dogmatic persuasion. Part of the difficulty in becoming aware of our own culture is that a basis of comparison is often lacking. The cross-cultural perspective helps us to see our own culture. Having been socialized to perceive space in a certain manner, we find it impossible to imagine how it could be seen differently. The purpose of the crosscultural perspective is not to encourage value judgements about which culture is better, but to provide a means of helping us to understand another view of reality, and this enables us to come back to our own in a different frame of mind.

Today, we are all aware of the problems of over-population, pollution, and wastage of natural resources. Probably each country has a different approach in solving this kind of problem. Curriculum content can present many different facets of world views so that we can exchange our ideas. Among the various approaches, when we choose the specific direction in which to go, we must take full responsibility for acting upon the idea. In the process of doing this we can become a co-producer of reality. As we begin to reconstruct our own value system by experiencing the reality directly, and as we communicate our findings to others, then, our new interpretation can lead to change in the society.

4. Dialogue

A large number of human relationhsips in any social group are still based upon a mechanical level. Individuals use one another so as to get desired results, without getting to know each other as real persons. This kind of relationship usually communicates at the level of superficial appearance-which is Korean or American, professor or student, rich or poor, etc. As long as the relationshipos remain upon this level, they form no true social group, no matter how closely their perspective activities touch each other. Giving and taking of orders modifies action and results, but does not of iteslf effect a sharing or purpose, a communication of interests.

Martin Buber describes man's two primary attitudes-the two ways in which he

approaches existence. One of these is the "I-Thou" relationship, the other is the "I-It." the difference between these two relationships is not the nature of the object to which one relates. Not every relation between persons is an I-Thou one, nor is every relation with an animal or thing an I-It. The difference, rather, is in the relationship itself. I-Thou is a relationship of openness, directness, mutuality, and presence. It may be between man and man, but it may also take place with a tree, a dog, a work of art. I-Thou relationship communicates on the basis of mutual respect for individual uniqueness. I-It, in contrast, is the typical subject-object relationship which does not recognize this individuality. Dialogue existis only implicitly in "I and Thou," that of "experiencing the other side" of the relationship. The act of inclusion is that which makes it possible to meet and know the other in his concrete uniqueness and not just as a content of one's experience.

How then can this principle of dialogue be conveyed by the curriculum so that we can try to communicate on a subjective rather than objective level? How can the curriculum help students to be aware of individual uniqueness so that they can build the concept of self-identity? When one possesses a concrete self-identity, one can reach out to others, and this will lead to the way of understanding others.

Dialogue relationship is lacking in higher education in many ways. Students often find themselves in college because thier parents feel they should be there. Society demands a degree as an entrance requirement into any established job or career. Students are caught in a dilemma : Is their education for some externally defined social purpose which they do not feel to be wholly relevant to human needs? Or is it for themselves?

Most institutions underestimate the importance of the questions : What they want to learn? What needs to be done? What work is worth doing? For most students, college is four years of mounting recognition that higher education leaves inadequate time and space for individual development.

Colleges and universities are now mass institutions that individual's needs and interests are not properly provided. While cognitive learning is continue to have high priority, the other kinds and styles of learning is ignored. The curriculum must offer experiences in creative uses of the intellect as well as analytical and emotional uses. It must offer practice in dealing with people from diverse backgrounds of various styles of life with differing goals, as well as practice in understanding their problems from a distance.

One way to promote the dialogue relationship is to share our common heritage. Every culture holds this basic human repertoire. We are built to feel warm, happy, and contented when caressed, to feel angry when frustrated, frightened when attacked, offended when insulted, jealous when excluded, and so on. Through this kind of emotional literacy we can share our commonalities. For instance, we all have different kinds of ritual ceremony. Through the ceremony we all express our inner feelings in some kind of comunicative act. Some years ago I happened to attend an Indian ritual ceremony in Oregon, U.S.A. The long hours of desperate praying and dancing reminded me of shamanistic ritual of Korea. Introducing the ritual ceremony in curriculum just emphasis on the information side, then it'll leave off so much of human common heritage of emotional literacy. If it were intorduced with an approach that asked what, why and how they pray and also

what kind of emotional relief they get from the ceremony, then, a better perspective would be gained for comparing it with other kinds of ritual ceremony. When we find some kind of common ground it will bring us closer together. When the student takes this through their emotional literacy and expresses it with their own value system, they can become a co-producer of reality.

There can be no doubt about the importance of dialogue. Dialogue is important, first, for an understanding of one's fellowman, and second, for the comprehension of the world as a meaningful social reality. Through this ontological process, we not only understand the other's momentary subjective process ; we understand the world in which others live, and that world becomes our own. Where the dialogue relationship is established we not only live in the same world, we participate in each other's being.

5. Conclusion

The technical revolution was rapidly creating new societal environments. But the college student does not significantly change his view of himself or the society in which he lives. While rocketing through space and on the point of conquering the heaven, he is fast losing touch with his own world. The number of college student has increased tremendously. Also knowledge has spread, but it has not abolished war, or fear, nor has it made all men brothers. Instead we are suffering from loss of self-identity, alienation, and uncertainty.

One of the reason for this is the curriculum in higher education is not designed properly. While cognitive learning is continue to have high priority, the analytical and emotional side of curriculum is ignored. The content of the curriculum usually indoctrinate the already socially legitimized and typificated values to the student. The student who has been socialized with this kind of education, never realized that he possesses the freedom to reinterpret the cultural assumptions. The curriculum must introduce students to a variety of styles of learning as well as a variety of bodies of knowledge.

In the process of curriculum reform, it is essential to employ the three existential points of view-which are expressed as construction of reality, freedom of choice, and dialogue. In this way, it can bring us toward international understanding and cooperation which are desperately needed in our world today.

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University Management of International Technology Development and Transfer

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Lester Thorow, a world renowned economist, declared in an address at the University of Washington, "The United States Economy is Dead ; The Global Economy is alive and well. As evidence for this he cited the following : Manufactured products frequently contain parts manufactured in two or three different countries and in addition, may be assembled in another country. Many large corporations have become multinational conglomerates with subsidiaries in other nations. Many corporations with a national base have large international markets or are dependent upon natural resources purchased in another country. Technology developed in one country is easily transported to another for development and another for production of a product. What happens to the economy of one country influences deeply another country as was experience by the drop in the U.S. stock market last October.

Telecommunication makes instant communication possible. Events that happen in one segment of the world are quickly communicated to another accentuating our interdependence. Global teleconferences, symposia and workshops via telecommunication are possible. We have become more keenly aware of our mutuality when encountering global issues such as hunger, health, environmental ecology, transportation, communication, the global economy, and the threat of nuclear catastrophies.

The potential for bringing experts together to work on solving global issues exists. We can use the technology we have for abusive purposes and excessive profits ; or realizing our mutuality, brotherhood, and community in moral and ethical ways use it to address and meet human needs as well as to foster a healthy global economy.

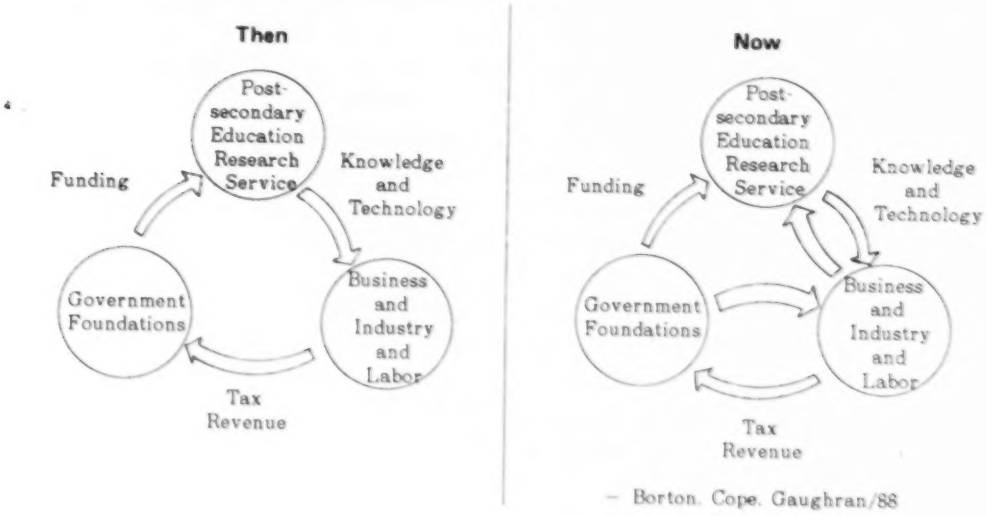
The challenge is to question "How to adequately reward researchers for their efforts in discovering technology and at the same time disseminate the technology to foster the innovative development of that technology into commercializable products that stimulate the global economy and into solutions that meet the human needs of mankind.

A new but salient university role is emerging. The research university is being encouraged to become a proactive advocate and participant in the transfer of technology. Few, if any, comprehensive models exist for the management of the technology transfer process. In this paper I will examine the cycle of technology transfer, the component parts of a technology transfer model, a proposed planning and management model, and criteria for evaluating the product outcomes of the model. Aspects of strategic planning and a cont extual-based decision-making model will be incorporated into the proposed planning and management model.

The university has not always been encouraged to transfer technology or to become

partners with business and government. Indeed its birth was in the cloistered communities of monks. Now, however the responsibility of the university is not only to preserve and to transmit knowledge to the public, but its expanding role intensified by the New Information Society is to create new knowledge through empirical research and to provide knowledge services. State of the art knowledge is a commodity to be bought and sold. Marketing and/or dissemination of knowledge theoretically results in innovation, in invention of commercializable products and in the emergence of new services, both which stimulate the economy by creating new jobs which return revenues back to the government who uses a portion to fund higher education (See Exhibit 1).

Exhibit 1. The Public-Private Economic Cycle



– Borton. Cope. Gaughran/88

The United States, stunned by its loss of economic world leadership, faces a shrinking global economy in which they are receiving a shrinking share of the income. In the United States large corporations have been increasing unwilling to risk heavy investment in long term research (basic research) and have primarily opted for investment in short term (applied research). The federal government, recognizing the need left by business investor's myopia, has increasing supported long term basic and applied university research and development. In additament businesses are being encouraged by the 1986 Tax Reform Act to increase their investment in basic research at universities and other non-profit research institutions by a 20% tax credit on research grants, contributions, and contracts at qualifying facilities made legal by the government (Council on Research and Technology p. 3.). This has precipitated the a rapid rise in the number of joint contracts and partnership programs between businesses, industry and the university in the United States. Government is also investing directly in contract research with business (See Part II, Exhibit 1).

Japan, the world economic leader, has purchased basic research and technology overseas in the U.S., England and West Germany and has concentrated 60% of its domestic research

on process and product development. (Gindele p. 27). Contrary to our perception of Japanese as the "packagers" of technology, they are increasingly a source of new ideas in electronics, telecommunications, materials and biotechnology. In addition they are bolstering their support of (and access to) foreign university research through grants, contracts, and collaborations (Lauhica).

In the United States Federal legislation, amended in 1984, transferred ownership of federally funded research from the government to the university. Patent laws were rescripted to reward both the faculty and the university for commercialization of a product or process. Many universities followed suit by revising their patent policies to implement the intent of the new law (Clearing House on University Industry Relations, 1985). The new law placed motivation (monetary rewards) closer to the idea source as an inducement to produce commercializable results. In 1981 Declercq in England observed "universities are being drawn to the center of high technology-based economies from their former position at the outfringe of economic society ; " however, now as a result of these new effort universities are being drawn there with increasing rapidity.

There is, however, a "critical gap" between the university and the industry. Geographical separation, differences in goals, orientations, and motivation, confound this gap. The university is concerned with the production of new knowledge and with preserving and disseminating knowledge. It is unencumbered with the need to make a profit. Traditionally, professors preferred isolation that fostered a more precipitous gap between themselves and business. Academicians perceived of themselves as separate from and untainted by motives of businessmen. Some academics still fear, perhaps with some reason, contamination of their research and seduction of their academic freedom in the service of business.

Business, on the other hand, primarily concerned with making a profit to even survive, conceives of professors as impractical, unrealistic and unaware of the productivity schedule necessitated by the profit motive. Business, concerned with the profit motive and the schedules which maintain productivity and profitability, emphasize product output. Business has the need to maintain secrecy in the form of trade secrets and sometimes to impede the publication of results. It has the need to dictate the direction research takes towards results which have large profit potential and away from disinterested and open inquiry (Langfitt, 1983).

The problem then is how can technology transfer be managed to bridge this gap, provide incentives for research and development of commercializable products, contract relationships with businesses, and maintain academic freedom of inquiry? What are the linking pins that hold this bridge together? What are the moral and ethical questions involved in such linkages? New linking structures are being built and new rules and guidelines governing proprietary rights, publishing, patents, and licensing are being developed to insure that the interests and rights of various parties are considered and guaranteed ; and that there is a balance between the rewards people receive for their efforts and the benefit and value that technology has to society and the solutions for its needs (Cleveland, 1985 ; Goldman, 1987).

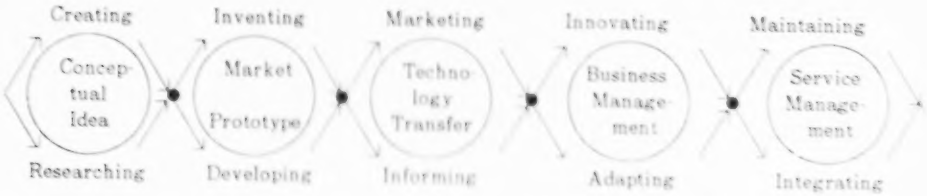
Before discussion of the components parts of a technolohgy planning and management

model, terms must be defined.

For this paper, "Technology" is the application of pure science (basic research) to produce new or innovative changes in products, supporting activities, and services. New technology both expedites and produces change. "Technology transfer"is the moving of technology from the sending agent (inventor, researcher, developer, university or owner) to the receiving agent (developer, entrepreneur, business manager or manufacturer). Various technology trasfer mechanisms are available as the linking pins connecting the agents. The linking structures are referred to as infrastructures.

The product life cycle consists of various steps which unfold as basic research idea moves toward becoming a commercial product that could serve as the nucleus for a new business. Initial invention requires both conceptualization of the idea and a proof of concept to prove its technological feasibility. Only ten percent of funding and effort comprise this first step ; the other 90% is required to develop a market prototype, to transfer it to business production and marketing, to manage the business connected with it, and to manage the service required by it. Inventions are hard to market to venture capitalists without development of some of these further stages creating an almost unjumpable hurdle to obtain seed capital. Between the conceptualization of the idea and completion of a marketable product prototype, funding is usually filled by self finance or by begging and borrowing capital from friends. This is a critical funding hurdle in the flow of technology from research to the development of commercialization of a product. Resources need to be developed to add value and provide marketing leverage for these inventions. Capital investment for further product development, prototype development, product testing, and manufacturing are steps.

Exhibit 2. Technology Utilization Model



The problems facing management of technology transfer fall under two major categories :

1. Those decisions involving the development of various technology transfer infrastructures, and

2. Those decisions for evaluating how and to what extend to fund further development of the ideas of basic research.

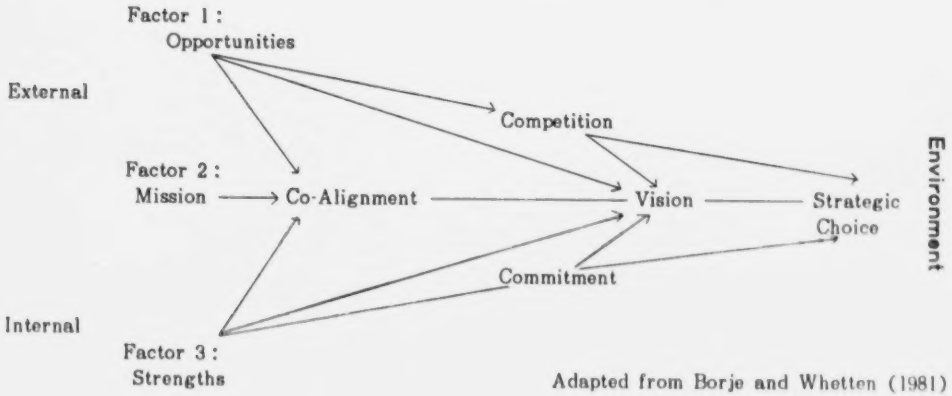
In other words, how far through the product cycle should an enterprise follow and

support the concept, developed in basic research, before licensing and selling it or allowing the individual entrepreneur to develop it.

In this model the overarching management style used will be a strategic planning model, a technique to position one's enterprise in such a way in the market place that it increases the flow of resources into the enterprise as well as increases the quality and effectiveness of the output. Elements in the strategic planning model include : an analysis of the mission and purpose, key success factors and threats and opportunities in the environment. Strategic choices are made with the purpose of positioning an enterprise or its products to achieve alignment between the internal resources, the output (products), and the external market needs ; and having achieved it, to gain a comparative advantage (See Exhibit 3).

Exibit 3. Contextual Planning(A Model)

Adapted by Borton from Cope/86.

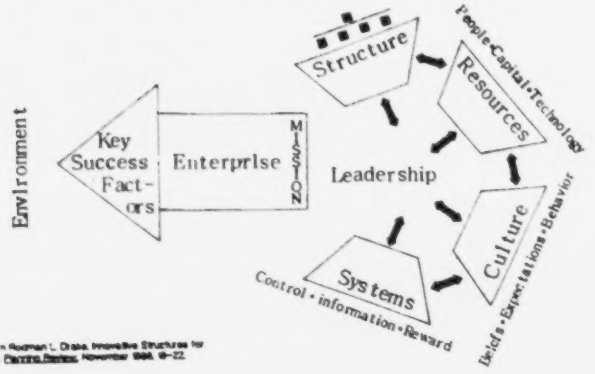


Adapted from Borje and Whetten (1981)

Path Analysis of the Contextual Model

The contextual model of management focuses decision-making on a systematic analysis of the situation. It is one of the management theories drawn from in this paper. For the purpose of this paper, I will use the various categories of factors for analysis of the situation as a tool on which to base strategic choices. These factors become criteria for making strategic choices. (See Exhibit 4)

Exhibit 4. Strategy Design & Implementation Model



Adapted by Cope from Rochan L. Dass, Innovative Structure for Managing Change, Electro/Comm, November 1984, 9-22

Developing a set of quantifiable factors by assigning a numerical rating on a chosen scale such as (1−7) to each factor provides a strategy for decision-making. If the factors are chosen because of their relevance to the development of infrastructures for technological transfer or for funding development of specific technologies, then we have a technological management model. The factors can contribute to producing efficient and effective decision-making. For managing this process, I submit the following categories of factors to examine : factors regarding the economy, the role of the institutional/enterprise, the degree of risk involved for the institution/enterprise, and factors regarding the infrastructure (Each of the following exhibits 5−8 elaborates on one of these categories.).

Exhibit 5. Factors for Evaluating the Economy

Technological Change	Low ----------	High
Technological Fields	Distinct ----------	Emerging
Foreign Competition	Weak ----------	Strong
Market Focus	Domestic ----------	Global
Product Market	Mass ----------	Batch
Basis of Profit	Mass production ----------	Value Added
Human Resources	Unimportant ----------	Competitive
Rate of Skills Change	Slow ----------	Fast
Size of Business	Lg. Business ----------	Sm. Business
Economic Growth	Sunset ----------	Sunrise

Exhibit 6. The Type of Role Played by The Institution

National
Regional
Urban
Local
Technical
Flagship (State/Several State Leadership)
International

Exhibit 7. The Degree of Risk Involved

Leadership Support	Low ----------	High
Ties to Private Sector	Low ----------	High
Special Resources	Low ----------	High
Well-defined Needs	Low ----------	High
Flexible Administration	Low ----------	High
Mission and Goal Fit	Low ----------	High
Government Ties	Low ----------	High
Economic Development Agency Ties	Low ----------	High
Faculty Interest	Low ----------	High
Faculty Rewards	Low ----------	High

Exhibit 8. Infrastructures Which Are Supportive to The Efforts

Tax Structures	Not Conducive ----------	Conducive
Quality of Schools	Low ----------	High
Quality of Life	Low ----------	High
Transportation	Low ----------	High

The above factors can be regrouped to fit the contextual management model (See exhibit 9). The following are examples of grouping these items by categories :

THE ENVIRONMENT :
What are the social, technological, economic, and political trends in the environment ?
What are the threats/opportunities ?
How can threats be turned into opportunities ?
Who are the major stakeholders ?
What are their technological needs ?

Exhibit 9. The Idea Matrix : A Guide to Implementation Research

	Idea	Implementation	Impact
STRUCTURE Roles Structure Formal Informal			
RESOURCES People Capital Technology Buildings Equipment			
CULTURE Heros/Stories Beliefs Attitudes Expectations Behavior/Emotion			
SYSTEMS Control Information Reward Funding			

– Borton. Cope/87

What are the possible linking pins to those stakeholders ?
Where are the available resources ? Human, Financial, Informational, Material ?
How can these be accessed ?

STRATEGY OF THE ORGANIZATION :
What are the mission, goals, and objectives of the university or enterprise ?
Do they link it to the strengths or turn weaknesses or threats into opportunities for the university ?
What and where are the resources ?
What is the direction of travel ?
What is the product output ?

ORGANIZATIONAL STRUCTURES :
What are existing structures for technology transfer ?
Where are there structural gaps ?
What are other forms of organizational structure available ?
What are the external structures that are available ?
What roles do the structures play ?

TECHNOLOGICAL RESOURCES :

Characterize the technology

What are the dominate technologies of the enterprise and those outside the enterprise ?

What is the mode of their delivery ?

What are the needs and potential relationships of the technology to other technologies ?

What are the vested interests ?

What is the rate of change of the technology ?

HUMAN-CULTURAL RESOURCES :

What are the dominate human resources ?

What is the level of their skill ?

What is their socio-political culture ?

What faculty (personnel) support and interest is there ?

What are the ethical/moral values ?

FORMAL SYSTEMS :

What are the rules and laws in place governing technology transfer ?

How is technology transfer governed ?

What are the reward and penalty systems ?

What are the communication and telecommunication systems available ?

What are the rules and guidelines that need to be developed ?

CURRENTLY EXISTING MODEL STRUCTURES :

Traditional Examples : Although most colleges and universities have the traditional technology transfer mechanisms—the graduate student, internships, publications, and conferences—in place to varying degrees ; service-oriented technology transfer mechanisms useful in establishing and maintaining communication networks, are less common. These include direct education to businesses, consulting relationships and industry affiliate programs ; and they can be used to build good will and to be channels for information exchange. Industries may affiliate themselves with university research on a particular technology by paying a fee. For instance ELDEC corporation, an electronic manufacturer for component parts used in the aerospace industry, is a part of the Industrial Affiliate Program at the University of Washington. The university plans regular information meetings to update the affiliates on research in a particular field like electronics and provide opportunities for feedback from the industry. The industrial affiliate program is virtually a like a subscriber service.

Newer Examples : A newer breed of technology transfer mechanisms, developed by many U.S. college campuses includes Technology Transfer Offices, that market basic research and technology and assist faculty in the patenting and licensing process. For example, David Shapiro at the University of Washington Technology Transfer Office, works closely with the medical school to market biotechnology. Research disclosure, patenting, licensing and market research are coordinated through technology transfer offices and /or patenting

offices. Examples of these offfices are found as either part of the internal or the external structure. Patenting is usualy regarded as acceptable because it financially benefits the university and the researcher and provides incentives to bring about the level of commitment necesary to sustain research (Samuelson, 1987).

Forward-looking Examples : Ventures with increasingly more partnership and involvement with business include Venture Capital Funding, Joint Research and Development Contracts, Research Laboratories and centers. The Ben Franklin Partnership in Philadelphia and the Edison Projects in Ohio are examples of state venture capital funds. Private venture capital funds exist as well. Joint research contracts with business are exemplified by the one Harvard has with Monsanto Company that provides $23 million to the college over 12 years and supports study of biology and the biochemistry of organ development. Harvard will retain 10 to 15% of the stock as well as royalty income from patents. Issues such as use of lab space, leaves of absence, training of graduate students and freedom to publish are negotiatable items in such contracts.

The newest type of programs include the development of extension programs providing technical assistance, super-computer access, electronic networking programs, business incubators, technological/industrial parks, high technology corridors, and science cities. Business incubators, are organizations which nurture newly fledgling business and business strat-up through the initial stages of development by providing technical assistance. Business plan assistance, financial and market consultation, and legal advice are available services at the incubator, which usually provide low cost rental space for the new businesses as well. The Business Innovation Center in Utah is an example of a for-profit incubator ; it takes an equity in the company for its services. Rensselaer in New York is an example of a non-profit incubator, which offers high technology start-up businesses business/financial resources as well as a link to use of campus facilities.

Electronic networks connect researchers with other research universities, regional and national laboratories and with business for information exchanges. An example of this type of that at Carnegie Mellon. Examples of research parks and high tech highways include University City Science Center in Philadelphia, a group of businesses, business incubators, and research institutes which are located incomplexes within the city. University Science Center includes 75 companies, 8 buildings and a payroll of $110. Route 128, located in Massachusetts has recently gained fame in the Presidential Campaign of Michael DuKakis because he was instrumental in its growth and development. Route 128's business and industrial complexes dot the highway from Boston to Cambridge, respectively.

Tsukuba, Japan is an exciting example of a Science city. Tsukuba National university is located near Tokyo Tsukuba Science City boasts 26 research institutes covering most disciplines of the physical, biological, and social sciences and 9 research centers (chemical, computers, acceleration, animal research, mechanics, crygenus, education, hydraulics, and isotopes). Both institutes and centers perform projects and problem-oriented research and provide opportunities for inter-disciplinary research and information exchange.

The available machanism vary according to degree of risk, sophistication of staff and management, and resource investment (See Exhibit 10).

Exhibit 10. Technology Transfer Mechanisms

Risk	Options	Investment
	· The graduate student	
	· Internship	
Low	· Publications	Passive
	· Conferences	
	· Direct Education	
	· Consulting	Active
	· Industry Affillate Programs	
	· Technology Transfer	
	· Patents and Marketing	
Medium	· Venture Capital Funds	
	· Technology Licensing	
	· Joint R&D	
	· Technology Centers	Partnership
	· Centers for Excellence	
	· Research Institutes	
	· Technical Assistance	
	· Extension Programs	
High	· Electronic Networks	
	· Incubators	
	· Technological Parks	Vested
	· Science Cities	— Borton, Cope, Gaughran/88

INTEGRATION :

How does this model effect the international development and transfer of technology. We must consider the factors involved in the strategic alternatives that face us and the mission of our organizations in the context of the Pacific Rim and the World. What actions will encourage further research, innovation, and technological development to meet human and social needs in targeted areas? How can we cooperate to solve the problems which face the Pacific Rim and the Globe?

The world is experiencing turbulent times and this is an opportunity for institutions to creatively to respond by developing innovative efficient and effective infrastructures for technology transfer. A model such as this proposed model for technology management and decision-making could provide balance and still be profitable to the entrepreneurial individual, enterprise or institution wanting to examine potentials for developing various technology transfer infrastructures or initiatives. Avoidance at all cost of all commercial ties may be naive ; but to rush into commercial ties without considering the value of disinterested inquiry, the moral and ethical issues involved, and the potential technology has for solving human need is rash. We must cautiously work together to realize our mutuality with other nations, with business, with government and with other universities. We must appreciate and allow for differences between the university and these other entities. We need to together carve our guidelines for collaboration.

How long will it take us to learn to collaborate? We face serious problems including acid rain, the AIDS virus, the depletion of energy sources, waste disposal, terrorism, domestic violence, traffic congestion, air and water pollution, and diminishing natural resources. I am reminded every day of the traffic problems in Seattle as I drive across the Lake Washington bridge in stop and go traffic and I learn that the population on the Eastside of Lake Washington will almost double by the year 2000 and driving anywhere will take twice as long ; or of the acid rain as I water my garden, or of the diminishing timber resources as I drive through the mountains and see the clear cuts or hear of a forest fires on the television news.

It is possible to build infrastructures for international cooperative technological solutions for these problems before it is too late? Perhaps Seoul could share its experience and technology in the development of public transportation with Seattle.

Harland Cleveland in his book "The Knowledge Executive" points out "When you share knowledge you do not loose it you merely multiply it." The other day I was asked by a friend to help to paint the outside of her house. I was very busy and could not afford to take the time but she was asking just for a few hours of help in the morning and I agreed to it. I laughed thinking how little painting we would finish. To my surprise there were eight people there ; one was an experienced house-painter with knowledge and painting equipment. By noon the house was painted. I was energized to return to my work. Later she rewarded us with a dinner at a Thai Restaurant and her thankfulness. The painting would have taken her 2 weeks to do alone, How can we multiply our knowledge resources through collaborative efforts to solve targeted problems of mankind and at the same time be individually adequately rewarded for it? In giving we receive.

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College-level Engineering Education for Industry Workers

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1. Background

Industrial modernization brought about in Korea for the last couple of decades owes its momentum to the steadfast political will of the government and people's desire and determination to build a better life for themselves. In concrete terms successive five-year economic and social development plans implemented since 1962 were the major forces of change, in the course, taking the country to the present state and to the point of joining the ranks of the so-called NIC's(Newly Industrialized Countries). As was true with many of the developing nations in Asia, agriculture had been a chief means of living for Koreans. But today Korea is clearly looked upon as an industrialized nation in the process of conversion from agricultural economy to industrial which took approximately three decades, the country has undergone tremendous changes in terms of economic and social structures as wolll as political.

During this period there brought about not only economic affluence in physical sense but also corresponding modifications in culture, values, customs, social status and elevated aspirations of the people towards better life. Also the pace of changes apperas ever acceleration. The volume of the industrial work force has also greatly increased as the industry itself developed and expanded. Consequently, the secondary and vocational education had to be expanded enormously to accommodate the explosive demand of manpower from the industry side. However, due to diversity and quantity of manpower demand, individual industry had to establish and operate its own training systems in a decentralized fashion in addition to more centralized public vocational training centers.

As industrial work force grew bigger, its systematic as well as on-the-job traninig became extremely important. The importance of education and training in industry today is comparable to investment for production facilities or to research and development of new products. Technological world evolves so rapidly, technology-related information inundates the society at large and the desire to imporve the social status of the workers grew ever stronger. Now, there are many people who believe that the future of a company may depend upon how adequately the company can prepare the education and training for his personnel to cope with the environmental and technological changes.

Korean society is also experiencing a drastic change of its social infrastructure since mid-1980's exhibiting the stronger desire for democratization in every branch of the society. In this context, it is universally acknowledged that coresponding change in the level of public consiousness should be accompanied by the external changes, which may be accomplished only by adequate education and tranining.

It is well known that Korea is one of the countries with highest rate of post-secondary education population. However, as one may find from Table 1, she is far from satisfactory accommodating such explosive desire for higher education. One may note the large gap

that exists among national quota, applicants and admittees into higher education. Only less than half of the applicants would successfully proceed to further studies every year.

Table 1. Admission to Higher Education

Year	Category	National Quota	Applicants	Admittees	Ratio of admittees to applicants
1982	Junior Collgs	105,830	149,927	98,740	0.64
	Collgs & Univ	154,650	563,244	191,399	0.34
	Total	260,400	713,171	290,139	0.41
1985	Junior Collgs	97,090	178,125	106,483	0.61
	Collgs & Univ	165,630	511,810	201,934	0.39
	Total	262,720	689,935	310,417	0.45
1987	Junior Collgs	696,930	228,222	110,234	0.48
	Collgs & Univ	170,570	513,167	194,657	0.38
	Total	267,500	741,389	304,891	0.41

*Statistical Year Book of Education 1982, 1985 & 1987, Ministry of Education

It is observed that with the acumulation of the young people failed to enter into tertiary education there arose a number of problems of one sort or another. Among those who went to the industry directly upon graduation of high schools or after some vocational training, there are many who desire to get higher education as a means of enhancing their social status. This is apparent in view of the higher education fever in this country and the solution to this problem must be sought as a matter of national policy.

At the earlier stage of industrial modernization in the late 60s, government initiated several national technical high schools to supply skilled workers who were then badly needed in great mass. These technical high schools attracted many top-level students from middle schools throughout the nation by dint of the governmental financial suppoort, as a result producing a number of skilled workers with good quality. However, their intelligence level and their desire for higher education caused them psychologically astray inbetween continue-the-job or stop-working-and-restart-study. By late 70s this phenomenon continued aggravate and a few engineering colleges newly opened to meet this need, a typical example of high degree of higher education fever, especially in the world of skilled workers.

Table 2 shows the number of low class employees of D-Group living in the Seoul Metropolitan area and that of student-workers attending to higher education above the junior college level. The higher education institutions listed in this table are evening colleges, correspondance college and colleges of industry.

It is surprising to note the high percentages, taking into consideration of the circumstance that they had to work normally during the worktime and sacrifice rest of the time to pursue their study. It may be one of the natural reflexion from young people to adjust himself to the rapid changes of economic and technological environment. This, of course, accords well with the nationwide trend stated above.

Table 2. Student-Workers Living in Metropolitan Area of D-Group as of 1987

Company	5th Grade Workers	Technical Workers	Total*	No. of Student** -workers	Percentages***
H	296	2,614	2,910(1,580)	181(178)	12.3(22.7)
A	794	5,074	5,868(2,356)	175(13)	3.2(8.0)
E	397	3,574	3,971(1,723)	137(30)	4.2(9.7)
S	857	5,983	6,840(3,415)	503(7)	7.5(14.9)
C	115	310	425(252)	11(15)	6.1(10.3)
Total	2,459	17,555	20,014(9,326)	1,007(243)	6.3(13.4)

* Numbers in parentheses show the workers from technical high schools

** Workers attending to higher education above junior college level. Numbers in parentheses are workers who have already finished their studies.

*** Numbers in parentheses are the overall percentage of workers under and after study.

2. Industry and Education

As insdustry develops and its impacts onto the society increases widely, its role and responsibility to the societal development becomse more and more important. This may be one of the characteristics common to all modern countries. For example, it is well appreciated that Japanese industries have been successful in maintaining dedicated employees by applying the traditional concept of lifetime employment.

The main theme of this presentation, a university-industry cooperative program of collegelevel engineering education, which is unique and first of its kind in Korea, has been born due to a determination based on creative and positive thinking of the top manager of a leading corporation in Korea. Underlying thoughts of the program may be stated as follows :

First, it is the consciousness of the role of industry as a major constituent in the national development. A company can be more than a place of make-living. It may play more important role in the national development by constantly transforming itself into a sound and strong constituent of the nation. For example, by providing learning opportunities to the higher education-hungry workers a company may not only motivate them to cultivate loyalties but also can muster cooperative power of workers within the company. This may be described as an expression of management philosophy taking human factors as its prime importance.

Second, it is the appreciation of basic role in the joint effort of university-industry coperation to develop qualified manpower capable of dealing ever changing and innovating modern technology problems. It may also create a new hope among the well-motivated workers to formulate a principle of juxtaposing Work and Study without much detriment to the present work ambiance. It will rather energize to level-up the productivity and in this way industry-university tie-up can also be strengthened.

Third, it is a thoughtful comprehension that a field job can be better understood and

more efficiently organized and managed by a field engineer. A capable worker selected and educated to the knowledge-level of an engineer through a program with field-oriented objectives may have closer insight in tackling the field problems and more persuasive power to the workers. Once an education system of such kind not yet very well established in this country can secure its root, this may not only enduce sound growth of the company, but also contribute well to the national develoment.

3. Overview of the Program

(1) Goals and Objectives

The prime consideration in this program was to provide an adequate college-level engineering education to industry workers. The formal education should allow students to cultivate sound characters of citizen capable of excercising common sense in a democratic society. Professional curriculum structure may be oriented to the development of field-job management capability with comprehensive knowledge in his particular discipline.

The graduates from this program may not be competitive with the graduates from existing engineering colleges. This program is not meant to compete with the existing formal programs but to complement them.

(2) Courses

According to the request of the host company, total number of students is fixed at 300 for the start. Four areas of disciplines are initially considered. Table 3 shows different disciplines, study span and number of students at each category.

Table 3. Disciplines and Number of Students

Disicplines	1st year	2nd year	Total
Mechanical Eng	60	30	90
Electrical Eng	60	30	90
Metallurgical Eng	40	20	60
Industrial Eng	40	20	60
Total	200	100	300

(3) Curriculum Sturctures

The basic sturcture of the curriculum was based on the general knowledge from secondary education. Anyone who had adequate secondary education can easily and systematically follow the learning process by maximizing his own interset and past educational background. It is hoped that knowledge level of each subject should be equivalent at large to that of existing Engineering Colleges. Figure 1 shows the fundamental concepts in formulating curriculum structures.

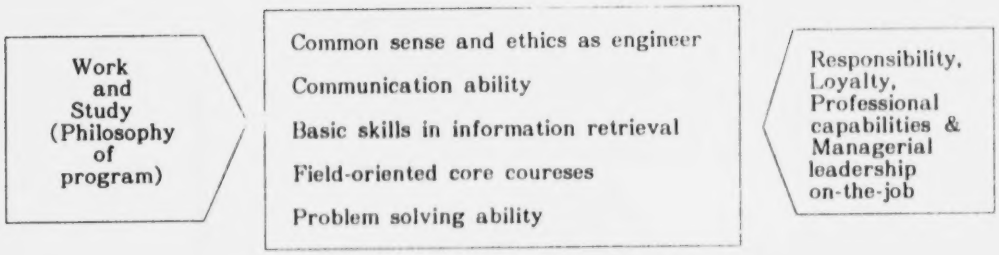
Work and Study (Philosophy of program)
Common sense and ethics as engineer
Communication ability
Basic skills in information retrieval
Field-oriented core coureses
Problem solving ability
Responsibility, Loyalty, Professional capabilities & Managerial leadership on-the-job

Figure 1. Basic Concept of Curricula Development

(4) Implementation

This program is basically founded upon the work and study principle. The class begins at 6 : 00 PM lasts till 9 : 10 PM from Monday through Saturday. One academic year comprising 48 weeks is divided into three terms. A term consists of 16 weeks. There are one-week breaks between terms and two week break at the end of the academic year.

A regular college-level study requires two academic years. A compact course equivalent to junior college-level which requires one academic year of study, is incorporated in this system. This compact course also serves partly as eliminatory process for those who are not academically qualified after one year of study. Total calss hours of a regular course is some 2,300 hours, approximately close to that of an existing 4-year Engineering Colleges.

General administrations including entrance procedures and student guidances are provided in the same manner as in the regular 4-year college. in this way student-workers may have some feeling of self-confidence relative to the regular college students.

Because of their employee status, it is precluded to excuse any leave of absence during the academic year. A series of invited lectures on general themes such as literature, music, fine arts, philosophy or theatre are also provided every terms to complement extre curricular interests.

4. Discussions

Students are selected from a population of several tens of thousands workers through oral and written examinations. All classes for regular courses are open in the evenings. Students have to continue daily job-duty during the day. As a consequence, the followings are raised as problems or points to keep a close eye on for the enhancement of the study environment.

· Student-workers have different educational background, e.g., differences in basic curricula in secondary education and several years of passage of time without any academic related activities there on.

· Students have determination to get over any difficulties encountered that may hinder their studies.

· Two-year intensive insturctions which cover 4 year equivalent course contents may lead to superficial understanding of the subjects, with lack of time for self-development.

· Continuation of daytime-work and evening study may aggravate the physical conditions of the students resulting in excessve tiredness, drowsiness, mental as well as physical fatigue.

· Students may not have opportunities for counselling or guidance to orient themselves because of the tight schedule.

· How to mobilize teaching staff and maintain their morale during the vacation periods or under adversary weather condition.

5. Conclusions

The cooperative program described here is still in its infancy and it is by no means complete. In fact many questions are under debate. There are rooms for improvement and adjustment and necessary modifications will be implemented to the benefit of the students first of all. However, the underlying philosophy and basic principles will be firmly retained.

It is our hope that this program may give fresh thrust onto the existing education system to vitalize itself and encourage the cooperative education to prosper.

Summary and Conclusions

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As we near the close of this splendid conference we should like to take this opportunity to express our appreciation to the members of the Organizing Committee—Joon-Suk Oh, Chul Kim, Seung-Yo Son, Seung-Hwan Lee, Chul-Hwan Kim, Byung-Rim Koo, and Wha-Kuk Lee. They have provided us with a conference the quality of which we shall spend years trying to match. We are much indebted to you, gentlemen, for your work and should like you to stand and receive the recognition you deserve.

I should also like to recognize Professor Joon-Hee Park of Ewha Women's University, who will assume the PRAHE presidency later this afternoon. We first met in Honolulu in 1985, when he shared with us his dream that PRAHE would some day come to the Republic of Korea. The following year he and Dr. Oh of Ajou University came to our conference in Vancouver, and at that meeting we voted to meet in Seoul in 1988. It has proven an excellent decision. Thank you, Professor Park, for leading us to it.

As these past two days have progressed I couldn't help remembering that meeting a decade ago in a small room at the student union building at the University of Washington where PRAHE began. Our intentions at the start of that meeting were to establish a regional organization for the discussion of ideas and issues important to higher education. Our perspective was limited to the states of Washington and Oregon and the province of British Columbia. One of our members had just returned, however, from a sabbatical in Australia ; and he challenged us to broaden our perspective to include the entire Pacific region. We accepted this suggestion, but during the next several years that followed we had trouble living up to the claims of our title. Attendance at times was miniscule, and representation from throughout the Pacific region scant. More recent conferences in Honolulu, Tokyo, and now Seoul have changed this pattern, however, and we can now truly claim to have achieved the status of a Pacific region association.

Our conference here in Seoul has contributed mightily to the status of the Association, and I turn now to what we have heard during the past two days. In keeping with our theme, "Higher Education and the Asia-Pacific Century," we have talked togeter about the changing status of the Pacific region. World attention, long focused on the Atlantic and relations with the European community, is turning increasingly to the Pacific, which has come to play a dominant role. Moreover, here within the Pacific region we are seeing a change in status. No longer can the Pacific be considered an American or Soviet moat or lake. Nemerous nations—Korea, Japan, Malaysia, and Taiwan among them—have grown to such prominence as to force a new perspective on the region, one in which the concept of dominance is replaced by that of interdependence. As a region, in other words, we are now dependent on each other as we have never been in the past.

Within this context we have identified three major responsibilities of higher education in

the Pacific region. One such responsibility, internationalization, provided the theme of our conference last year in Tokyo ; and it arose again this year here in Seoul. As discussed these past two days, we can accomplish this internationalization in a number of ways. Our curricula can go beyond the traditional Western-dominated subjects to newer subjects that acquaint us better with the people, geography, and cultures of our neighbors throughout the Pacific. And we can continue to expand the number and quality of educational exchanges—of students, faculty, educational materials, research, and publications.

Of all of higher education's responsibilities to the region, internationalization should come the easiest. Quite truthfully, I cannot think of another institution in society that is more disposed to this concept than higher education. For centuries we have sent our students abroad for study. Whenever we as faculty members have received sabbatical leaves, we have often tried to combine them with assignments abroad. We are obviously open to increasing the flow of people and ideas between nations. PRAHE exists for this very purpose.

We have had less experience, on the other hand, with ties between industry and higher education, the second of three responsibilities we have assigned to higher education at this conference. Here we deal with two groups—industry and higher education—which in some of our nations have had minimal experience working with each other. If anything the two groups harbor a good deal of misunderstanding toward each other. Yet we have heard at this conference about exciting initiatives that are underway. Here the leadership may come from Japan and the Republic of Korea, which have a longer history of close ties between industry and higher education. Especially impressive are the ties between Daewoo and Hyundai that exist here in Korea. Also most exciting is the consortium at Pohang described at this conference by Professor Young-Gul Kim, in which a new, highly selective technical university, a research institute, and a major steel industry are working together to their mutual advantage. We can learn much from these experiences.

We have also talked at this conference about the relationships between civil government and higher education. This area has its problems and might well become the theme of a future PRAHE conference. Government is looking increasingly to education as a primary vehicle for keeping nations economically viable, and the ties between industry and higher education which I just discussed are one example of this phenomenon. Government needs to assist in these efforts, and most of us can cite from our own experience instances wherein government has provided funding and other incentives for bringing the two together. Government can also contribute to educational exchanges, and the Fulbright program of the United States is just one example of such efforts. Financing educational exchanges is expensive, and institutions require outside help if they are going to have successful programs.

We have also discussed the need for government to allow higher education the autonomy it needs in order to function adquately. We have heard instances discussed at this conference—in Great Britain, Australia, and the state of Maryland in the United States—where civil governments, concerned that higher education contribute more directly to the economy, have reduced the autonomy that their higher institutions once enjoyed. Meanwhile,

other nations, such as the Republic of Korea, offer examples of increasing autonomy, which follow decades of strong governmental influence. As Burton Clark makes clear in "The Higher Education System," higher education functions best in those situations where civil government yields adequate autonomy to institutions of higher education.

We have shared our ideas here in Seoul freely these past two days, but we should not stop simply with discussion. These are good ideas. They deserve that action be taken. We should, therefore, form task forces to work further on them. Let me suggest that in our forthcoming business meeting we establish some task forces. Let me propose that we invite Donald Warren to chair a task force on international partnerships, Hidetoshi Kato to chair one on the role of media in international education, Won-sul Lee to chair one on eudcational exchanges, Heung-soo Park to chair one on the role of higher education in the post-industrial information society, Kun-mo Chung and Young-gul Kim to chair one on ties between industry and higher education, and Akira Tachikawa to chair one on internationalization. Other possibilities wil occur to members of this audience. Let a call go out for volunteers to join these task forces, and let the groups prepare reports for next year's PRAHE conference at the University of California in San Diego. Let those reports then go to leaders in higher education, industry, and civil government throughout the region.

In my country we use an expression these days that we call "the T-word." As you know, we are in the midst of a national election, and a volatile issue connected with that election is the subject of taxes. Because of its volatility we don't use the word "taxes," but when we want to refer to it we simply say "the T-word" instead. At this conference our T-word is a C-word : "competition." It's a concept that hinders the international partnerships which we have here embraced, and we therefore tend to use it sparingly. Nevertheless, it is also a concept important in my culture and of growing importance in a nember of nations of Marxist-Leninist orientation. Rather than "competition," we have tended instead to emphasize another word starting with "C," : "cooperation." Here's a word at the heart of all that we in PRAHE stand for, and the task forces I am here proposing provide a vehicle for its further practice.

With this plan for action I shall conclude my remarks and make way for the PRAHE meeting that follows. In closing let me once again express on behalf of all of us here our genuine appreciation for the splendid conference which our Korean hosts have provided for us. We shal not soon forget what has happened here these past two days.

A Participant's Report on the '88 PRAHE Seoul Conference

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An annual conference of Pacific Region Association for Higher Education was opened at Seoul Hilton International Hotel during 17th and 18th of last August. Nearly forty papers were presented in this conferences. These studies will be published in the future, however, it is worthy to review them before publication like a gleaning after the harvest. Thus, this paper is a review of these papers and discussions in the plenary and sub-sessions.

1. Opening

Although a terminology of "Global Village" has been used for a long while, this writer realized its actual meaning when Seoul was designated as a host city of the '88 Olympic. Almost one month prior to the Seoul Olympic Games, an international conference regarding the missions of higher education in the new era was successfully opened at Seoul Hilton International Hotel with nearly four hundred participants including domestic and foreign scholars.

The conference was hosted by Ajou(its meaning fits into the slogan of Asian-Pacific Century) University and KCUE(Korean Council for University Education).

President Hyo-kyu Kim delivered an opening address as a representative of host nation which was brief but sharp to pin-point out the importance of an establishment of international cooperative system for the development of higher education in rapidly changing societies. He also emphasized that the development of science and technology would take a key role for the world of the future.

Dr. Wan-kyoo Cho, the chairman of the KCUE made a speech of welcome after the opening address. In the welcome address, Dr. Cho stressed on the necessity of international cooperation and exchange of knowledge to overcome the difficulties which the modern universities faced such as preservation of academic excellence, change of university role according to the new demands, and solving financial difficulties for increasing educational demands.

The congratulatory address of Minister Young-shik Kim was meaningful because he requested the embodiment of good-neighbor relationship. He stated that "this seminar will become an occasion to deepen the friendship among neighbor countries much like the Korean proverb-your neighbors are your relatives."

Finally, Dr. David Whittaker, professor of University of British Columbia, Canada, presented his study under the title of "Higher Education and Societal Change : The Vanguard Personality Syndrome of University Students" as a greeting speech. For the analysis of the vanguard personality of students groups he illustrated the "Free Speech Movement" of students in Berkely campus during the midst of 1960's which led to the students' takeover of university's administration building and arrest of seven hundred and seventy three

individual. His presentation was impressive enough to reveal that he is a scholar, as he mentioned, who has been specialized in the psychological approach of higher education during last 25 years.

2. Keynote Speech

Two papers which were related to the major theme of seminar were presented as the keynote speeches. Dr. Duk-choong Kim dean of Sogang University, presented his study under the title of "In the light of New International Environment the Role of Higher Education for Peaceful Coexistance of 21st Century." Dr. Donald Warren, a professor of University of Maryland, presented his study after the presentation of Dr. Kim. The title of Dr. Warren's presentation was "International Partnerships in Higher Education Issues for the 21st Century."

These two presentations were in sharp contrast in terms of their presentation style. Dr. Kim put his focal point on the external changes of higher education system and the problems of higher education with the macro economic perspectives whereas Dr. Warren's point of view was concentrated on the internal factors of higher education.

Dr. Kim began his presentation by comparing economic growth rates between Western industrialized countries and Newly Industrializing Countries. According to him, it is not unreasonable to call the Newly Industrializing Countries as a group of becoming dragons because the Newly Industrializing Countries showed an average of 10% of economic growth rate, while Western industrialized countries showed that of 3%.

Dr. Kim contended that Korea has had many handicaps due to the geopolitical location. Korea has been victimized by surrounding nations which strived for hegemony. The situation was much like the proverb, "shrimps suffer from a side blow in a fight of whales." This disadvantageous geopolitical location made Korean people have a fatalistic view on their lives. In spite of the fatalistic view on life, Korean parents' enthusiasm for their children's education brought about the educational expansion at an elementary and secondary school level. The educational expansion produced a faithful, industrious, and able laborer for the labor intensive industries which were crucial in economic development. As a consequence, Korea became the 10th of worldwide trading nations. He believed that Newly Industrizing Countries are now forming a part of new international environment so that they do not have to depend upon the powerful countries, and functioning as a conerstone for the establishment of international economic order. The significance of higher education in modern society was also emphasized by Dr. Kim. He insisted that in modern society, the higher education should contribute to increasing benefits of each country as well as the peaceful coexistance of the world.

On the contrary to the presentation of Dr. Kim, Dr. Warren focused on the international cooperation in higher education for the 21st Century. According to him, in the process of formation of modern nation, universties occpied an important position for increasing national benefits of each country. However, in the 21st Century, the research function of university should be more emphasized than before because the researth efforts for new knowledge and technology could break the barrier between nations and help them

accomplish the international cooperation.

The most interesting point in the comparison of university management system which was presented by Dr. Warren was a tendency of centralization in the United States. Up untill 1945, the main characteristic of university system in the United States was an institutional autonomy system. The self-sufficient-management system gradually changed and now it appears as a unified management system in each state. The tendency of centralization in the United States was a refection of the efforts to maximize the accountability of higher education and stress the state goal of eductaion.

According to Dr. Warren, the other new tendency of university crriculum in the United States was the emphasis of core-curriculum which focused on the Western culture. This tendency was supported by the educational traditionallists and the political conservatives. Although the local studies and the study of Eastern Culture were suported because fo the economic reasons, the resistance to the cultural relativism in the general education curriculum of university was ever increasing.

Dr. Warren, however, believed that the cooperative study, exchange of knowledge, international conference, and exchange of scholars and students should be expanded to accomplish the goal of university-a quest for an eternal and universal truth. Dr. Warren closed his presentation by saying that "We, as scholars and leaders of an academic field, should be a new kind of educational diplomats."

3. Plenary Session

After the lunch, the plenary meeting which dealt with more specific topics was held. It was composed of two sessions. The title of the first session was "Cooperation of Higher Education" and the second session was "Cooperation of Higher Education with Industry and Research Instititutes."

President Won-sul Lee, the first speaker of the first session, explanined the historical background of "Pacific Rim Age" on the basis of his profound knowledge as a historian. Dr. Lee insisted that even though U.S.S.R and U.S.A are the two most powerful nations in world politics, it cannot be under-estimated that the group of Asia-Pacific countries are now rising as a powerful group in world economy. The Asian-Pacific countries, thus, should be treated as a partner rather than the peripheral countries in world politics. He also insisted that Eastern and Western countries should produce a single universe culture through the exchange of culture and knowledge. He assumed that the products of the countries in Asian-Pacific Rim will occupy 55% of General World Prouducts in the future and build up the mutually prosperous relationshop in world economy. New role of education, thus, should be excuted for a new era. Unilateral implementation of educational system of Western society should be avoided and the mutual exchange in education between Western and Eastern countries are desireable. For the practice of mutual exchange in education, he recommended frequent exchanges of educational information in addition to exchanges of scholars and students and the expansion of mutual efforts in researches and publication of educational materials.

Dr. Kato Hidetoshi, the second speaker of the first session, presented the study of

"Intertnational Cooperation through the Electronic Media." Dr. Hidetoshi illustrated University of South Pacific which located in Fiji island and providing high quality of higher education through the distance teaching. According to Dr. Hidetoshi, the distance teaching of University of South Pacific was a representative case of international cooperation to cope with the scarcity of human and academic resources which many island countries were facing. He also reported that the distance teaching has spreaded to many other countries so that the number of students who registered in Asia Association of Open Universities reached nearly two hundred fifty thousand in 1987. He mentioned the Korean Brodcating University successfuly achieved their role as a distance teaching institution. He also stated that economic underdevelopment and cultural deprivation could be overcomed if we use the electronic media as a media as a means to provide the higher education and to promote the international cooperation.

After the presentations of both speakers, Dr. Kyong-dong Kim discussed about those presentations. He made positive reaction to the both presentations. However, he also gave an sociological analysis concerning the problems inherent in the process of acculturalization.

Although the cooperation between three sectors-industry, academia, and research institute-is a desirable social demand, the tendency of exclusionism in each sector brought about a stagnation of cooperation among them and, furthermore, produced the antagonistic tendency against each other. On the basis of this fact, the first speaker of the second session, Dr. Kun-mo Chung began his presentation with the issue of self-existance of university.

Dr. Chung assumed that the cooperation between industry, academia, and research institute is a necessary task because development of technology and international competition could be achieved through the creative and independent research activities. Thus, the independent research activities should be included in the university curriculum for the achievement of academic excellence. For this purpose, university should not limit its role to the provision of Degree-program and extend its role to provide a inservice program for the people in the sector of industry. At the same time, the industry also should provide the support to the university by expanding of long-term financial support. Since experts of each sector follow its own kind, frequent meetings among the experts of each sector were suggested to reinforce the cooperation between the three sectors.

The presentation of Young-gul Kim, dean of Pohang Institute of Science and Technology also touched on the cooperation between the three sectors. He reported that while university absorbed 85% of higher professionals(Ph. D degree holders), industry and research institutes absorbed 3% and 14% of Ph. D holders. However, the proportion of research investment among university, industry, and research institutes was 5.5%, 68.5%, and 26% respectively. This statistics showed that university was a barrens for research and the industry was suffering from the scarcity of research specialists. Thus, he insisted that the lacking of cooperartion between the three sectors is a national loss. From this point of view, and attempt to cooperate between education, research, and consultation in Pohang Institute of Science and Technology deserved to receive the words of complement. Even though the conflicts among the people who engaged in three sectors and the uncertainty which came

from the high expectation of managers are existing problem, the cooperation between industry, academia, and research institute is not only the wish of the speaker but also the wish of everybody who concerned with the national development.

4. Sub-sessions

The morning session of the second day was consisted of four sectional meetings. Each sectional meeting was proceeded by the couple of invited lectures and four or six paper presentations. Almost 30 papers were presented in the sub-sessions. Free exchanges of opinions among the participants made the atmosphere of the conference dynamic and refined.

The subtitle of the first section was "Case studies on International Cooperation in Higher Education." In this section, Dr. Heung-soo Park gave the first presentation – "Role of Education in Post-Industrial Society with Special Reference to Korean Case." He stated that only through the active international exchanges in education, young generation cannot be subordinated to the technological society and take their role as a leader tring to improve the interntional environment in post-industial society. Dr. Denis Blight presented the case study of international cooperation of Austrilian Universities which broke the White Austrialia Principle.

A case study of cooperation between developed and developing countries in the area of education for technician, which occured in Philipine, was introduced by Dr. David Chantril. Dr. Dusit Jesdapipat presented the problems and strategies of higher education in Thailand through the economic analysis. Dr. George M. Oshiro introduced the international programs of Obirin College at Tokyo and Professor C.B. Padmanabhan reported the case study of India. Professor Joon-hee Park presented the case study of Korea and Dr. Chawalit Putthawongs dealt with the subject of institutional consortium of Northern Thailand.

Under the subtitle, "Prospects and Problems in International Cooperation", Professor In-jong You opened the second section meeting with the presentation of "Internationalization of Inter-University Cooperation and Its Prospect and Problem to Overcome." He contended that internationalization of Inter-University Cooperation is possible only when the problem of language barrier, antagonistic tendency in university, and narrow-mindness of administrators are solved. After him, Professor Akira Tachikawa discussed about the prospects and problems in international cooperation by using his experiences as a professor of International Christian University in Japan. International Christian University was established after the Second World War. It has been unique to use both English and Japanese languages in teaching. As a strategy for the expansion of international cooperation, Professor Tachikawa provided following recommendation : requiring the completion of internationalized course, freezing students' enrollment quota in large cities, increasing students enrollment quotas in local university, inducing a foreign university branch at local university, and hiring foreign professors.

Noi Chamdumpai, a professor of Sonkla University of Thailand, explained the estabilishment of sisterhood relationship with foreign university. Brent Poppenhagen, a professor of Hawaii University requested the cooperation in survey which related to the exchange of scholars

and teaching method in pluralistic society. David Rogers, a representative of British Council in Korea, stressed the role of British Counell as a media for exchange of scholars and students. Sho Takakura dealt with the problems of educational exchange of Tsukuba University in depth.

Under the subtitle of the third section, "Inter-sectional Cooperation in Higher Education", professor Ernst Gunter Schilling presented the comparative study regarding the cooperation between industry and academia on the basis of his experience of staying in Korea. He pointed out that Confusianism in Korea brought about the emphasis of theoretical approach in the education of Korean students and this tendency is a main cause which prevents the cooperation between industry and academia. According to him, Korean students are more likely to assume flexibility for seeking optimal solution as a fickleness because they are used to solve the problem on the basis of black and white judgement.

The analysis of Dr. Schilling was supported by the empirical data which were provided by Dr. Mu-keun Lee who gave a presentation after Shilling. According to Dr. Lee, 92.5% of department chair-persons in his study responded that they did not take opinion of people who work in industry sector for planning and development of the university curriculum. Professor Young-il Mok contended that the substantial reason for the disharmony between industry and academia mainly caused by the different value systems and rigid attitudes of their own. According to him, the people in industry sector did not communicate with outsiders because an outsider was considered as a heretic, by the same token, the people of academia sector only devoted themselves to the theoretical approach with the detachment from the real world. As a consequence, cooperation between industry and acadmia stagnated. For the effective inter-sectional cooperation, professor Mok suggested the correction of distorted viewpoint, rectification of misinformation, breakage of mistrust between the two sectors, and an establishment of a communication channel.

Professor Myung-ja Nam touched the problems of university education under the title of "Curriculum Reform for Cultural Literacy." She claimed that university education in these days do not provide the sufficient education for an educated people to put him/herself on another's place. If we assumed that the purpose of university education is a refinement of studens' value, professor Nam's indication is very important in its patholoical approach. Although professor Nam did not touch the problems of cooperation between industry and academia, her study can be understood in the context of former presentation which pointed out the lack of a communication channel between industry and academia.

"Science Education and Language of Instruction" was presented by professor Akira Mikake. He reasoned that the significance of English language is caused by the fact that many research papers in science are written in English and English is an official language of international conference.

The comparative studies of "Distance Education Development in Thailand, Korea, and Japan was presented by professor Sompong Orapin. Professor John Alex Mckenzie, an exchange professor of Tokyo University of Fisheries, claimed the necessity of law education in democratic society in addition to the example of law education.

The subtitle of the forth section was "Research Collaboration of Higher Education with

Industry and Research Institutes." Professor Pimol Rienvatana from Thailand reported the case study of "Interdisciplinary Project on Water Resources Management Center" and professor Seoung-yo Son, a professor of Ajou University, presented the case study of intersectional cooperation in engineering education for industry workers. As he mentioned, the engineering education for industry workers is a revolutionary attempt because such attempt can motivate industry workers. However, the engineering education for industry workers seemed to have a problem because the content of four year undergraduate program should be mastered in two years.

Ms. Nancy M. Burton from University of Washington presented a model of university management system for technology transfer. Professor Srisakdi Charmonman and professor Tepprasong Vorayos reported the case studies which were related to the subtitle of the forth section.

5. Closing

The meeting which was lasting two days with 30 presentations was closed by the summarizing and concluding remarks of Dr. Don Williams who is a professor of Washington University. After the Dr. Williams' remarks, PRAHE annual meeting was followed.

Dr. Don Williams seemed to be deeply touched when he requested an audience to give a big applause for Joon-suk Oh, Chul Kim, Seoung-yo Son, Seung-hwan Lee, Byung-rim Koo, and Wha-kuk Lee who organized the seminar. He celebrated the enlargement of conference which was demonstrated by large-scale participation of prominent scholars from Asia-Pacific Region. As a concluding remark, Dr. Williams made three main points as following : First, the expansion of educational exchange between the neighborhood countries in the Asia-Pacific Region is the task to be achieved. Second, the efforts for the cooperation between industry, academia, and research institutes is needed. Third, mutual support which minimize the interference between the government and university and maximize the autonomous administration of university is desirable. Dr. Williams closed his statement by expressing his hope that the cooperation between industry, academia, and research institutes could be practiced in the near future.

As a participant, this writer would like to evaluate the seminar as a successful international meeting which had a couple of meanings. First, this conference is significantly meaningful because the image of future university was presented through the participation of scholars who came from Asia-Pacific Region. Even though many Asian countries have had long history of education they are still remaining as the peripheral nations in the aspects of creation and application of knowledge for the national development. Thus, the future university should function as a driving force for the national development. Second, the construction of cooperative system between universities is the other meaningful point which was discussed in this seminar because the education exchange is the new demand of these days. Although the speakers of this seminar did not present their study with the slogan of "Innovation", the contents of each presentation showed the spirit of innovation. The educational innovation is a characteristic of modern university which resulted from the frequent contact of educational reformers.

The free exchange of opinions among all participants during lunch and dinner deepened the friendship and prepared the foundation of cooperation in the future. In the peaceful and friendly mood, all particiapnts were singing the folk songs of each country and the international academic symposium which overcome the national barriers was closed. It was also impressive that Mr. Suk-hee Lee chairman of Daewoo Foundation, and Dr. In-suk Chang Secretary General of Korean Council for University Education had participated in the whole sessions, just as ordinary participant observers, although they had provided all the administrative and financial support to make the conference a grand success.

APPENDICES

1. Programme of the Conference

2. Members of the Organizing Committee

3. Members of the Advisory Committee

4. Notes on the Organizing Institutions and PRAHE

5. List of Participants

1. Programme of the Conference

August 17 (Wednesday)

09 : 45~10 : 15 Registration

10 : 15~11 : 00 Opening Ceremony

Moderator : *Prof. Chul Kim, Ajou University*

- Opening Address

  Dr. Hyo-kyu Kim, President of Ajou University

- Welcome Address

  Dr. Wan-kyoo Cho, Chairman of KCUE

- Congratulatory Address

  Dr. Young-shik Kim, Minister of Education

- Presidential Speech

  Prof. David Whittaker, President of PRAHE

11 : 00~12 : 00 Keynote Speech

Moderator : *Prof. Brent Poppenhagen, University of Hawaii*

- *Prof. Duk-choong Kim, Sogang University*

  The Role of Higher Education for Peaceful Coexistence of the 21st Century in the Light of New International Environment"

- *Prof. Donald Warren, University of Maryland*

  "International Partnerships in Higher Education : Issues for the 21st Century"

12 : 00~13 : 30 Lunch hosted by Dr. Hyo-kyu Kim, President of Ajou University

13 : 00~14 : 30 Session Ⅰ : International Cooperation in Higher Education

Chairman : *Prof. Gordon Nelson, University of Wisconsin*

- *Dr. Won-sul Lee, President of Hannam University*

  "Educational Exchange in the Pacific Rim Age"

- *Dr. Hidetoshi Kato, National Institute of Multimedia Education*

  "International Cooperation through Electronic Media"

14 : 30~15 : 10 Discussion Ⅰ : *Prof. Kyong-dong Kim, Seoul National University*

15 : 10~15 : 30 Coffee Break

15 : 30~16 : 30 Session Ⅱ : Cooperation of Higher Education with Industry and Research Institutes

Chairman : *Dr. Sang-joo Lee, President of the University of Ulsan*

- *Prof. Kun-mo Chung, Ajou University*

"Cooperation of Higher Education with Industry and Research Institutions : The Case in Science and Technology"

· *Prof. Young-gul Kim, Pohang Institute of Science & Technology*
"A New Experiment in Academia-Industry Collaboration : The POSTECH/RIST/POSCO Case"

16 : 30~17 : 00 Discussion Ⅱ : *Prof. Sang-chul Shim, KAIST*

17 : 00~17 : 30 Floor Discussion

17 : 30~19 : 00 Cocktail Party hosted by Dr. Young-shik Kim, Minister of Education

August 18 (Thursday)

09 : 30~10 : 10 Invited Lectures

Section Ⅰ : Case Studies on International Cooperation in Higher Education

Chairman : *Prof. Soo-keun Kim, Ajou University*

· *Prof. Heung-soo Park, Yonsei University*
"Role of Education in Post-Industrial Society with Special Reference to Korean Case"

· *Dr. Denis Blight, International Development Program of Australian Universities and Colleges*
"The International Development Program of Australian Universities and Colleges(IDP) : Past, Present and Future"

Section Ⅱ : Prospects and Problems in International Cooperation

Chairman : *Prof. Colin Mackerras, Griffith University, Australia*

· *Prof. In-jong You, Korea University*
"Internationalization of Inter-University Cooperation Prospects : and Problems to Overcome"

· *Prof. Akira Tachikawa, International Christian University*
"Prospects and Problems in International Cooperation"

Section Ⅲ : Inter-sectorial Cooperation in Higher Education

Chairman : Prof. Soo-bok Lee, Ajou University

· *Prof. Young-il Mok, Ajou University*
"Barriers and Issues in Corporate-Academic Collaboration"

· *Prof. Ernst-Günter Schilling, Hamburg University*
"Imminent Practical Aspects of Engineering as Legitimation of Cooperative Education"

Section Ⅳ : Research Collaboration of Higher Education with Industry and Research Institutes

Chairman : *Prof. Ki-hyun Kim, Ajou University*

- *Prof. Pimol Rienvatana, Chiang Mai University*
  "Interdisciplinary Project on Water Resources Management Center in Relation with International Research Collaboration"

10 : 10~10 : 30 Coffee Break

10 : 30~12 : 00 Presentation of Papers

Section Ⅰ : Case Studies on International Cooperation in Higher Education

Chairman : *Prof. Soo-keun Kim, Ajou University*

- *Prof. David Chantrill, College for Technical Education*
  "The Colombo Plan Staff College for Technician Education : An Example of Successful Cooperation between Developed and Developing Countries"
- *Prof. George M. Oshiro, Obirin College*
  "Bridging the Cultural Divide : A Report on International Programs at Obirin College, Tokyo, Japan"
- *Prof. Joon-hee Park, Ehwa Womans University*
  "A Dynamic Projection for Cooperative Development"
- *Prof. David Whittaker, University of British Columbia*
  "The University of British Columbia and International Cooperation in Higher Education in the Asia-Pacific"

Section Ⅱ : Prospects and Problems in International Cooperation

Chairman : *Prof. Colin Mackerras, Griffith University*

- *Prof. Brent Poppenhagen, Prof. Sheldon Varney and Mr. Theresa Highfill, University of Hawaii at Monoa*
  "The Higher Education Research Agenda for Teaching and Learning in Multi-Cultural Setting"
- *Mr. David Rogers, Representative, British Council*
  "Institutional Linking : British Council's Role in International Cooperation"
- *Prof. Sho Takakura, University of Tsukuba*
  "International Relations from the Viewpoint of Self-Evaluation and Tasks for Reform at University of Tsukuba"
- *Prof. Judy A. Shishido, Prof. Harold I. Ayabe, University of Hawaii at Manoa and Michael Heim, Hawaii State*

Department of Education

"Relationship between Caution Indices and Student Demographic Data in a Japanese Language Placement Examination Situation"

Section Ⅲ : Inter-sectorial Cooperation in Higher Education

Chairman : *Prof. Soo-bok Lee, Ajou University*

- *Prof. Mu-keun Lee, Seoul National University*
  "Direction of Activation for Cooperative Education in Higher Education"
- *Prof. John Alex Mckenzie, Tokyo University of Fisheries*
  "Law-related Education"
- *Prof. Akira Miyake, International Christian University*
  "Science Education and the Language of Instruction"
- *Prof. Myung-ja Nam, Ajou University*
  "Curriculum Reform for Cultural Literacy"

Section Ⅳ : Research Collaboration of Higher Education with Industry and Research Institutes

Chairman : *Prof. Ki-hyun Kim, Ajou University*

- *Ms. Nancy M. Borton, University of Washington*
  "University Management of Technology Transfer"
- *Prof. Seung-yo Son, Ajou University*
  "College-Level Engineering Education for Industry Workers"

12 : 00~13 : 30 Lunch hosted by Dr. Wan-kyoo Cho, Chairman of KCUE and President of Seoul National University

13 : 30~14 : 00 Summary and Conclusion
Prof. Don Williams, University of Washington
and
Prof. Ran-soo Kim, Yonsei University

14 : 00~15 : 00 PRAHE Annual Meeting

15 : 00~18 : 00 Tour to the Olympic Complex

18 : 00~20 : 00 Farewell Dinner

2. Members of the Organizing Committee

Joon-suk Oh, Ph. D. (Chairman)
Professor, Ajou University

Chul Kim, Ph. D.
Dean of Academic Affairs, Ajou University

- Seung-yo Son, Ph. D.
  Dean of Engineering College, Ajou University
- Seung-hwan Lee, Ph. D.
  Dean of Planning and Development, Ajou University
- Chul-hwan Kim, Ph. D.
  Assistant Dean of Academic Affairs, Ajou University
- Byung-rim Koo, Ph. D.
  Assistant Secretary General, Korean Council for University Education
- Wha-kuk Lee, Ph. D.
  Director of Educational Development Division, KCUE
  Professor of Chemical Education, Chonbuk National University
- Don Williams, Ph. D.
  Professor, University of Washington
  Secretary of PRAHE

3. Members of the Advisory Committee

- Hyo-kyu Kim, M.D., Ph. D.
  President, Ajou University
- Wan-kyoo Cho, Ph. D.
  Chairman, KCUE
- In-suk Chang, Ph. D.
  Secretary General, KCUE
- Ran-soo Kim, Ph. D.
  Professor, Yonsei University
- Joon-hee Park, Ph. D.
  Professor, Ehwa Womans University
- Duk-choong Kim, Ph. D.
  Dean of Commerce College, Sogang University
- Edward Beauchamp, Ph. D.
  Former President of PRAHE
  Professor, University of Hawaii
- Gordon Nelson, Ph. D.
  Past President of PRAHE
  Professor, University of Wisconsin Oshkosh
- David Whittaker, Ph. D.
  President of PRAHE
  Professor, University of British Columbia

4. Notes on the Organizing Institutions and PRAHE

Ajou University, founded in 1973, is a major private Korean university with strong international connections, with a pleasant campus in Suwon within easy reach of Seoul. The University is now enjoying national prestige as the leader of a new innovative generation of private institutions, offering sound career preparation and creative education.

The Korean Council for University Education is a unique inter-university consultative body in Korea and has as its members all the four year colleges and universities in the country. The Council was founded to promote the healthy development of higher education in Korea through inter-university cooperation. Since its foundation in 1982, the Council has placed a great emphasis on fostering international cooperation in higher education.

PRAHE is an international learned society, which publishes and stimulates research on higher education throughout the Pacific region. Though short in history, founded in 1976, PRAHE has an extensive membership in Canada, Japan, Australia, United States, Korea and Latin American countries.

5. List of Participants

Foreign Participants

David Whittaker	University of British Columbia, Canada
Donald R. Warren	University of Maryland, U.S.A.
Don Willians	University of Washington, U.S.A.
Brent Poppenhagen	University of Hawaii, U.S.A.
Sheldon Varney	University of Hawaii, U.S.A.
Nancy M. Borton	University of Washington, U.S.A.
Denis Blight	IDP, Australia
Colin Mackerras	Griffith University, Australia
Stephanie De Boer	Swinburne Institute, Australia
Gavan McCormack	University of Adelaide, Australia
Maurice Daly	University of Sydney, Australia
John Alex Mckenzie	Tokyo University of Fisheries, Japan
Akira Tachikawa	International Christian University, Japan
Hidetoshi Kato	National Institute of Multimedia Education, Japan
Yoshiharu Eto	Chukyo Women's University, Japan
Keiko Sugao	Chukyo Women's University, Japan
Sho Takakura	Tsukuba University, Japan
George M. Oshiro	Obirin College, Japan
Akira Miyake	International Christian University, Japan
Pimol Rienvatana	Chiang Mai University, Thailand
Noi Chandumpai	Prince of Songkla University, Thailand
David Chantrill	Colombo Plan Staff College for Technician Education, Philippines
Adolf Gentile	Federal Republic of Germany
Günter Roesh	Federal Republic of Germany
Ernst-Günter Schilling	Hamburg University, Federal Republic of Germany
Dot Jackson	British Council, U.K.
David Rogers	British Council, U.K.

Korean Participants

In-suk Chang	Secretary General	KCUE
Byung-rim Koo		KCUE
Byoung-joo Kim		KCUE
Byung-hoon Rhee		Chonju University
Bong-ho Ryu		Ewha Womans University
Bok-joo Song		Kangweon National University
Chi-hoon Choi		Kangreung National University

Chong-ik Rhee	President	Chongju University
Chong-jae Lee		KCUE
Chong-kyu Ham		Sookmyung Women's University
Chong-yul Park		Kyungpook National University
Chun-keun Lee		Kangweon National University
Chung-hoon Choy		Yonsei University
Choong-hoe Kim		Chungnam National University
Chul Kim		Ajou University
Chul-hwan Kim		Ajou University
Chon-han Kim		Kookmin University
Dong-wa Park	President	Chang-won National University
Dong-sun Kim		Pusan Univ. of Foreign Studies
Dong-jin Shin		KCUE
Doo-hyun Choi		KCUE
Dong-kuen Choi		Hyosung Women's University
Dong-suck Chang		Nat'l Fisheries University of Pusan
Dae-myung Kim		Kyungpook Industrial College
Dong-suh Park		Seoul National University
Duk-Choong Kim		Sogang University
Eung-yun Hwang		Ewha Womans University
Han-sook Ahn		Ajou University
Hee-chae Chung	President	Seoul City University
Hyoung-Haeang Lee		Yonsei University
Hyo-kyu Kim	President	Ajou University
Hyung-ho Song	Presdient	Chonju Nat'l Teachers College
Hyun-chan Kim		Inje College
Hae-kyun Song		Seoul National University
Heung-soo Park		Yonsei University
Il-yong Lee		KCUE
In-jea Kim	President	Taejeon College
Im-sang Lee		Gyeongsang National University
Ik-dong Kim		Kyungpook National Univ.
In-jong You		Korea University
Jeong-cheol Choe		Ajou University
Jong-hee Ro		Hanyang University
Jae-kee Lee		KCUE
Jai-joung Kim		Chungbuk National University
Joon-hee Park		Ewha Womans University
Jung-mook Lee		POST
Joon-suk Oh		Ajou University
Keun-moo Lee		Ajou University
Ki-won Kim	Vice President	Hoseo College

Wha-kuk Lee		KCUE
Won-sup Kim	President	Chonbuk National University
Won-sul Lee	President	Hannam University
Woo-hyun Chung		Korea University
Wan-soo Yoon		Myongji Junior College
Wi-sup Song		Ajou University
Yng-up Ghi	President	Dongyang Tech. Junior College
Young-shik Kim	Minister	Ministry of Education
Young-kuk Kang		Dae-woo Group
Yung-chul Baik		Kwandong University
Young-jae Yim		Dankook University
Young-il Mok		Ajou Univeristy
Young-gul Kim		POST
Young-chang Cho		Paiwha Women's Junior College
Young-ja Park		Sookmyung women's University
Yong-beom Kim		Seoul National University